IT advisory firm honchos such as George Colony (left) of Forrester Research and David Gilmour (right) of Giga Information Group give the lowdown on their services. Buyer's Guide, page 90

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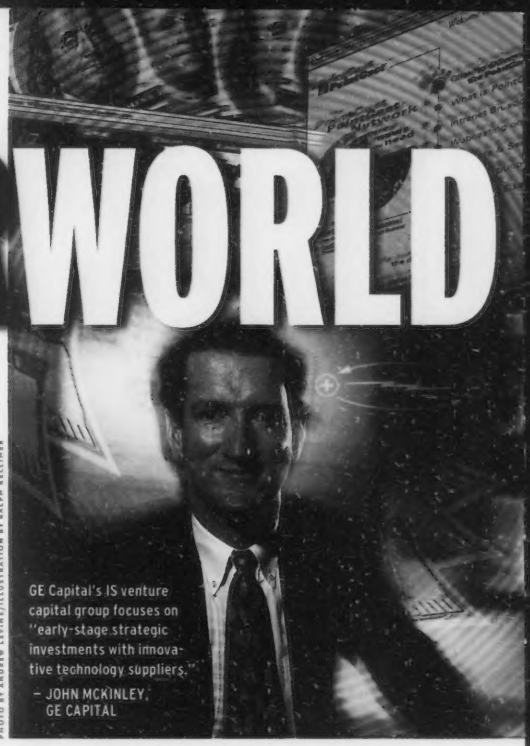

GE Capital's IS venture capital group focuses on "early-stage strategic investments with innovative technology suppliers."
– JOHN MCKINLEY, GE CAPITAL

PHOTO BY ANDREW LEVINE/ILLUSTRATION BY RALPH BELLMER

NT Server doesn't come cheap

▸ *Management, support costs stall migration*

By Laura DiDio

WARY USERS with the sense to do cost studies are finding that moving to Windows NT Server 4.0 will cost two to three times more than upgrading to the next level of their existing network operating systems — a point supported by several analysts' studies.

As a result, many of those users are holding off on a wholesale Windows NT 4.0 migration.

NETWORKING STRATEGIES

Computerworld conducted a random sampling of 15 Fortune 1,000 businesses, analysts and systems integrators. It found that not only is the cost of an enterprisewide upgrade to Microsoft Corp.'s Windows NT Server 4.0 significantly more than that of rival platforms to install and maintain, but some users got so bogged down, they

NT Server, page 16

AT&T to pitch 100M bit/sec. linkup for LANs nationwide

By Bob Wallace

AT&T CORP. IS quietly preparing what could be the first nationwide services for linking corporate LANs across the country without the usual bottleneck in the middle.

The unannounced services, to be rolled out next year, were designed to eliminate the logjam users encounter when trying to link high-speed campus LANs that use lower-speed wide-area network services, typically running at 64K, 128K or 1.544M bit/sec. [CW, Oct. 13].

Although some carriers offer those transparent LAN interconnection services, they are available only in limited geographic regions. The AT&T services will be available nationwide, said Joseph Lueckenhoff, vice president of product management

AT&T, page 14

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OPERATION OUTSOURCE
Feds launch massive effort to contract out all desktops. Next page

INTEL SHIPS MANAGEMENT TOOLS
But users with older hardware are left out in the cold. Page 4

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Policies on reimbursement for laptop, desk, phone vary widely. Page 12

Snail E-mail
IS managers worry that delivery slowdown could hurt E-commerce. Page 14

Sun lawsuit threatens to pull IE 4.0

By Sharon Gaudin

IN THE HEATED legal wranglings over the Java programming language, Sun Microsystems, Inc.'s trump card is to ask the court to stop Microsoft Corp. from shipping Internet Explorer 4.0. More immediately, it hopes to force the company to remove the Java Compatible logo from the most recent incarnation of its browser.

Sun last week also amended the breach-of-contract lawsuit it filed against Microsoft Oct. 6 in

Sun, page 132

IS risk-takers play venture capital game

By Thomas Hoffman

THE LIST OF investors that have poured money into PointCast, Inc., the Internet "push" media company, includes the usual cadre of venture capitalists, such as Silicon Valley's Mohr Davidow Ventures.

But one of the 12 investors on the list stands out as highly unusual: the corporate information systems division of GE Capital Corp. in Stamford, Conn.

The IS shop at GE Capital has a six-person Technology Ventures Group that focuses exclusively on "early-stage strategic investments with innovative technology suppliers," said John McKinley, chief technology and information officer at GE Capital.

McKinley's is one of a handful of pioneering IS units playing a high-risk game. It involves shelling out big bucks for equity positions in high-tech start-ups in return for insider access to advanced technologies.

Other companies with IS departments directly or indirectly involved in venture capital investments include Bankers Trust Co. in New York; Fidelity Investments in Boston; J. P. Morgan & Co. in New York;

Risk-takers, page 28

The AIAG's Don Blair: A glitch could halt auto parts delivery

By Thomas Hoffman **Worried** that a **year 2000** snafu at even a tiny parts maker at the bottom of the supply chain could **cripple U.S. automakers**, the automotive industry has cranked up a program to help suppliers fix their systems.

Automakers, page 132

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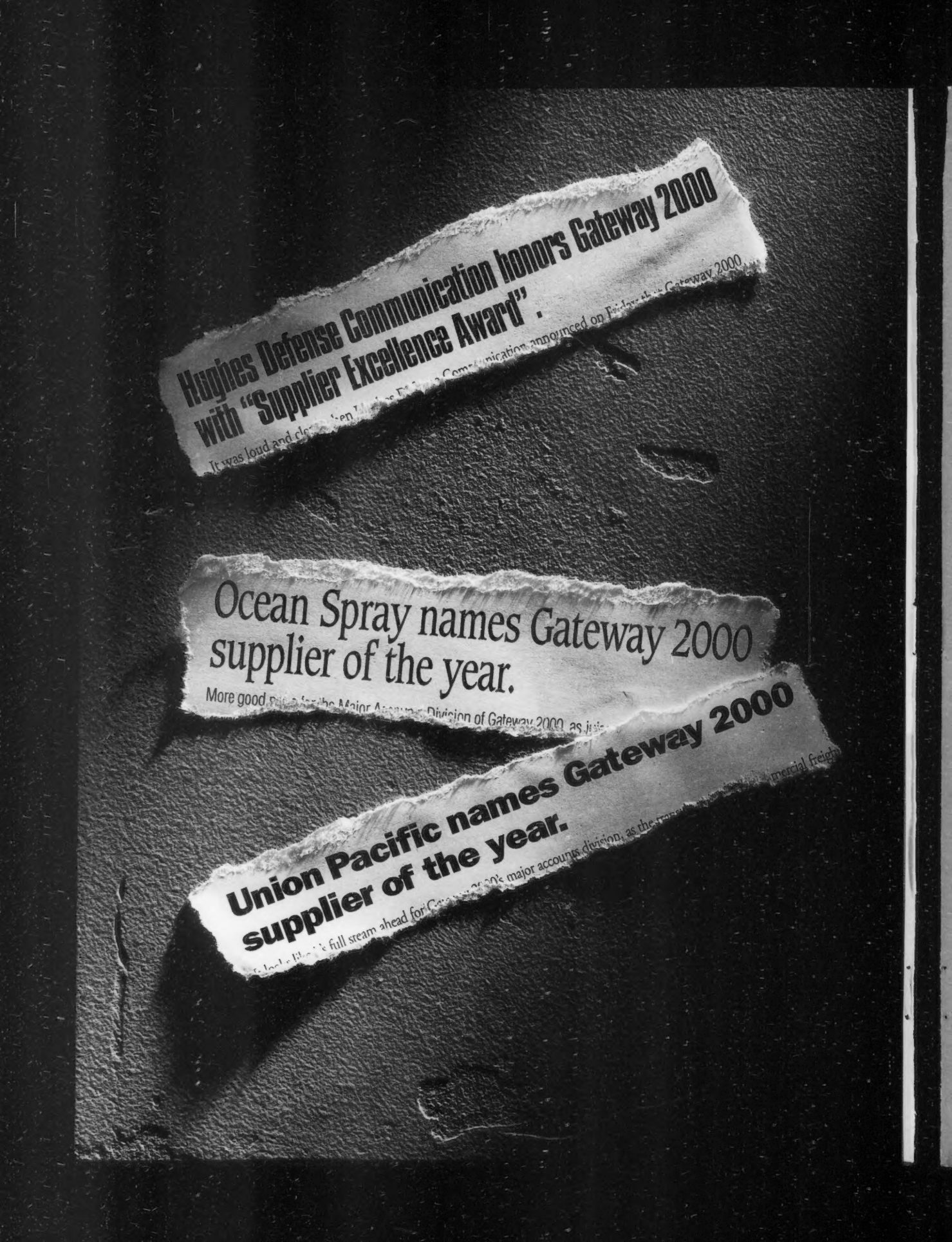
Hughes Defense Communication honors Gateway 2000 with "Supplier Excellence Award".
Ocean Spray names Gateway 2000 supplier of the year.
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Jan Mrazek says data mining helps The Bank of Montreal focus on customers. Data Warehousing, page 73

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Feds put giant outsourcing project on the launching pad

▸ Agencies could contract out for desktops

By Sharon Machlis

THE FEDERAL government's procurement center has begun an effort to help agencies that wish to contract out all aspects of their desktop computing environment: hardware, software and help desk.

"It's clearly the largest outsourcing [effort] the federal government has ever undertaken," said Paul A. Strassmann, a technology consultant in New Canaan, Conn., and *Computerworld* columnist.

The General Services Administration (GSA) earlier this month released a request for proposals for what it calls a Seat Management Services contract, which would turn government into "a user rather than an owner of hardware and software," the GSA said in a statement.

Vendors have until Nov. 3 to submit pitches to become a preferred outsourcing supplier. The GSA expects to finalize contract terms in March. Any government agency could then buy outsourcing services from the contract, without having to go through its own lengthy procurement process.

COST CONTROL

The goals are to get a handle on issues related to the soaring cost of ownership and make outside vendors responsible for keeping up with the latest hardware technology and software upgrades. Agency participation would be voluntary.

The move mirrors efforts under way in corporate America to transfer desktop services to outside specialists. "We are seeing the federal government look more and more like private enterprise," said George Logemann, an analyst at The Yankee Group in Boston. "The taxpayers expect it, and budgets demand it."

But there are key differences between corporate outsourcing, which is a business-to-business transaction, and the government, where there are complicated questions of selling public assets back to a private entity as well as specific legal and political issues, said Linda Cohen, an analyst at Gartner Group, Inc. in Stamford, Conn.

For example, some administrative agencies can't commit to a multiyear contract if they are subject to across-the-board percentage cuts, said Neil Stillman, deputy chief information officer at the Department of Health and Human Services. "I love the concept, but I can't use it," he said. Program agencies with different funding schemes don't have that dilemma.

HELPING HAND

Individual agencies may lack the expertise to draw up a good outsourcing proposal, which is why the GSA is developing a governmentwide purchasing schedule. "It's a great approach," Cohen said. "It's really going to open up the market so the vendors are willing to play."

Desktop outsourcing highlights

- Includes hardware, software, network and help desk
- For any agency – civilian or military
- Vendor proposals due Nov. 3; final contract expected March '98

The GSA previously had drawn up another outsourcing proposal for data center management, which is starting to be adopted, Cohen said. The Department of Education recently signed on.

The value of the new desktop contract, which the GSA pegs as potentially billions, depends on how many agencies decide to use it. At least some are interested.

"I believe the concept shows great promise in the federal sector," said Anne Reed, CIO at the U.S. Department of Agriculture. "We plan to study it carefully."

The National Aeronautics and Space Administration already planned to issue its own blueprint for outsourcing, including desktop systems, networks, voice, fax, pagers and help desk. The plan is due next month. □

Government seeks secure way to identify users of federal Web sites. Page 41

UP FRONT

Tele-confusion

I don't think it's too early to call the Telecommunications Deregulation and Reform Act of 1996 a disaster.

Last week's almost comic developments in the MCI saga pretty much nailed down that conclusion. In case you missed the histrionics, GTE jumped into the bidding war for MCI, trumping WorldCom with a lower but all-cash offering price and all but leaving MCI suitor British Telecommunications out of the picture. But the whole thing is still up in the air, pending MCI's board meeting.

This is beginning to resemble a *Three Stooges* comedy: "I'll take MCI." "Me, too." "Me three. Nyuk, nyuk."

If you don't understand what's going on with this deal, don't worry. It'll all change again soon. Deregulation, which was supposed to touch off frenzied competition to the benefit of businesses and consumers alike, has instead done just the opposite. Investment funds that should be going into infrastructure development are being funneled to investment banking firms to finance megamergers.

it'll all change again soon.

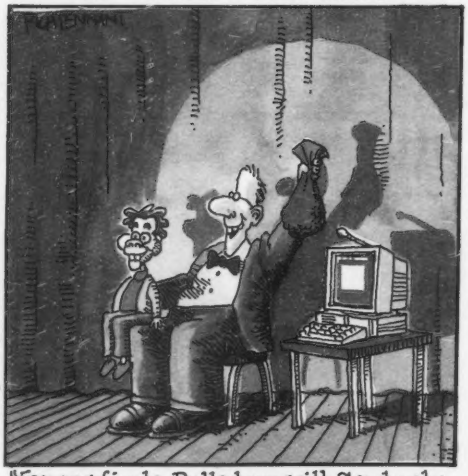
The regional Bell operating companies, when they're not busy buying one another, are sniping over how well they've lived up to the complex FCC rules on local access. The cable companies are so cash-strapped, they're asking Bill Gates for billion-dollar handouts. The auction of a portion of wireless spectrum was such a fiasco that the FCC is scrambling to come up with a payment program that will simply let the winning bidders stay in business.

Maybe this will all pan out into great customer bargains some day. But don't hold your breath. The people who'll benefit most from telecom deregulation will be the lawyers. Isn't that always the case?

Paul Gillin, *Editor*
Internet: *paul_gillin@cw.com*

THE FIFTH WAVE

BY RICH TENNANT



"For my finale, Rollo here will flawlessly activate my voice recognition system while I empty this bag of marbles into my mouth."

E-mail Rich Tennant at thewave@tiac.net

Eyeing the enterprise

▸ *Microsoft aligns with consulting, service firms*

By Jaikumar Vijayan

MICROSOFT CORP. is getting itself some powerful allies in its relentless push into the enterprise.

The software giant is quietly building key relationships with some of the most influential consulting firms and service organizations in the industry.

"Our success puts us in a position of responsibility to grow our consultancy," explained Microsoft CEO Bill Gates in a keynote address at a recent Gartner Group, Inc. conference.

For customers, that means more enterprise-level service and support, more packaged applications and more custom-development capabilities built around Microsoft products. "Microsoft has to build a different degree of credibility to get into the enterprise. This is a good way of doing it," said David Krauthamer, MIS manager at Parker Hanifin Corp. in Rohnert Park, Calif.

SERVICE IS VITAL

"What Microsoft has recognized is that for technologies like NT, BackOffice and Exchange to succeed, they need partners," said Jennifer Beck, an analyst at Dataquest in Westboro, Mass. "These are not products that are user-installable. They need to have good service programs wrapped around them."

Just last week, Ernst & Young LLP became the first of the so-called Big Six consultancies to formally open a dedicated development center at Microsoft's Bellevue, Wash., facility.

The center, called Entyron, will specialize in developing and deploying enterprise applications on Microsoft technologies.

Microsoft also recently entered into formal partnerships with Arthur Andersen and KPMG Peat Marwick LLP.

Arthur Andersen and Microsoft will work on deploying SAP R/3 applications on Microsoft platforms. KPMG is building a 500-person Microsoft practice.

Microsoft's strategy is by no means unique. Unix vendors, database companies and developers of complex packaged applications have long used partnerships with consultants and integrators to deploy their products.

In fact, many analysts say that the early success of vendors such as Oracle Corp and SAP AG had a lot to do with their partnering strategies.

Most of the initial opportunity for Microsoft will come from new applications that supplement Unix environments rather than replace them, analysts said.

Jeff Dazell, LAN administrator for network services at Dana Corp., a $7 billion automotive parts manufacturer in Toledo, Ohio, with 45,000 users worldwide, applauded Microsoft's ever-growing list of industry alliances.

"These partnerships tell me that Windows NT will become a standard and will have few, if any, gaps in functionality," Dazell said.

In addition to targeting the Big Six, Microsoft has been aggressively courting second-tier integrators and the services organizations of enterprise vendors such as Digital Equipment Corp., IBM and Hewlett-Packard Co.

Taken together, the alliances are giving Microsoft a crucial leg up in its attempts to grow beyond its traditional desktop and consumer base, said Tom Rodenhauser, editor of "Consultants News," a newsletter based in Fitzwilliam, N.J.

For example, Digital Equipment Corp., which was one of the earliest major vendors to enter into a service partnership with Microsoft, has contracts for 1.3 million seats of Exchange, Microsoft's messaging product. Digital also has more than 1,300 professionals delivering a range of services that includes integration of Windows NT Server, Exchange Server and SQL Server in multivendor environments.

IBM and HP, which got into service partnerships with Microsoft earlier this year, are both building large Microsoft consulting practices focused mainly on BackOffice and Exchange.

Microsoft's relationships with the Big Six vendors are focused on more specific areas of expertise.

For example, Ernst & Young will focus initially on helping customers build supply-chain management systems based on Microsoft technology. KPMG, which has decided to standardize internally on Exchange and Internet Explorer, will focus on customer support and electronic commerce. □

Senior editor Laura DiDio contributed to this story.

A sample of Microsoft's enterprise partners

Partner	Major area(s) of focus
Arthur Andersen	SAP R/3 integration
Digital	Network integration and enterprise messaging
Ernst & Young	Rapid application development
KPMG	Customer management and electronic commerce

& **Systems integrator helps McDonnell Douglas reuse legacy software. Page 41**

Microsoft plugs NT, IE security gaps

▸ *Workaround set for Workstation registry; network fix for browser*

By Laura DiDio

SECURITY FIXES have been posted, Microsoft Corp. executives said last week, after the company learned of two potential security gaps in the Windows NT Workstation registry and its Internet Explorer 4.0 browser.

NETWORK SECURITY

The first security issue involved a gap in Windows NT that could enable would-be hackers to compromise Windows NT Workstation security by launching a Trojan horse program that could corrupt files or give end users administrative privileges.

The hole in Windows NT's default registry system — which lets managers set access privileges in the "Everyone" setting — was discovered about 10 days ago by engineers at Internet Security Systems, Inc. in Atlanta, confirmed Ed Muth, a Microsoft group product manager.

Problems can arise when businesses upgrade their Windows 3.1 and Windows for Workgroups desktops to Windows NT Workstation, Muth said.

"Malicious employees can add an executable file, and the system would run it as soon as it boots. That in turn, lets the hacker see the permissions in the NT registry and get administrative rights," he explained.

After Internet Security Systems informed Microsoft of the security hole, Microsoft posted a fix on its World Wide Web page (*www.microsoft.com*). Users can edit the Windows NT registry so that the Everyone option in NT's permission security access is available only to administrators.

NO BIG DEAL

"We had the workaround ready within 24 hours of notification," Muth said. "This is a very, very minor issue, and we know of no instances in which hackers actually caused problems on Windows NT Workstations or networks."

In related news, Microsoft said it had also posted a fix to correct a security hole in the Internet Explorer 4.0 browser, which has been shipping for less than three weeks.

The flaw was discovered by German researchers who said it lets hackers access desktop files, provided that the intruders know the names and locations of the files. Because many application programs often use the same file names and location on every computer where they are installed unless the user specifies otherwise, the flaw could be a potentially dangerous one.

A Web site that exploits the flaw can bypass traditional network security mechanisms such as Internet firewalls. Also, sensitive company data could be copied across the enterprise network.

To close the gap, network administrators should disable Active Scripting by clicking on the Tools item in the menu, then Options, then Security, then Settings, then Custom. The system will warn that such changes are for expert users, but press on and disable Active Scripting. □

Four steps to testing Y2K

Year 2000 conversion managers say testing could take up as much as 70% of your time and effort. So why not get started now? In Managing, Senior Editor Robert L. Scheier walks you through the steps. Page 79

Compaq jumps into laptop leasing

▸ *Program offers financing, lower product prices*

By Kim Girard

NO MONEY DOWN! Attractive leasing options available! End-of-year closeout sale!

Yes, buying a notebook PC is becoming more like buying a car.

Compaq Computer Corp. last week announced a laptop leasing program through Compaq Capital Corp. and reduced end-of-year laptop prices by as much as 24%.

Compaq and other vendors are slashing laptop price tags to make room for new lines due at Comdex/Fall '97 next month.

Analysts said laptop leasing is a low-hassle, financially attractive option for a growing number of midsize companies.

Compaq's Armada 1500 leasing program, which starts today, includes all models of the 1500 series with 36-month lease rates ranging from $70 per month for the Armada 1530 to $99 per month for the Armada 1590. For a 24-month lease, pricing ranges from $96 to $139 per month for those models.

An Armada 1530 costs $1,999, marked down from $2,499. The price of the Armada 1590 has been whittled from $3,699 to $3,299.

"For most [user companies], leasing a laptop is new," said James Staten, an analyst at Dataquest, a research firm in San Jose, Calif. "They're used to leasing copy machines. This is a new trend."

Analysts said laptop leasing is a low-hassle option for a growing number of midsize companies.

Leasing is attractive because a down payment isn't required, the computer is typically paid off within two years, and monthly payments are tax-deductible, Staten said.

At the end of the lease, the company can choose to keep the machine or send it back to the vendor to be recycled.

Leasing is best-suited to the pricier laptops, however. "A $2,300 PC is worth leasing. A $1,000 PC is not," Staten said.

Other notebook vendors that offer lease financing include IBM PC Co. and resellers of Toshiba America, Inc. machines. □

Perot takes the wheel at National

▸ *EDS assumes lesser role in car-rental system*

By Thomas Hoffman

PEROT SYSTEMS CORP. last week shoved Electronic Data Systems Corp. into the backseat at National Car Rental System, Inc.

Perot Systems won a five-year contract to develop, operate and maintain a client/server-based car-rental system for the Minneapolis-based company.

EDS, which lost the two-vendor bidding contest to Perot, will continue to maintain the existing mainframe system for the next six to 12 months while the new system is developed and installed.

Financial terms of the Perot contract weren't disclosed.

Meanwhile, National Car Rental is "negotiating what further role EDS may have" in the company's future, a company spokeswoman said.

She was referring to a 10-year, $500 million contract EDS won in 1991 to run National Car Rental's data center operations and communications services. The rental agency may opt out of all or parts of the remaining contract, the spokeswoman said.

Perot's contract win wasn't completely out of the blue. The Dallas-based systems integrator won a 10-year contract with EuropeCar in 1991 to develop a similar system, which it continues to support.

For EDS, losing the National Car Rental account will probably do more damage to its ego than its balance sheet, analysts said.

National Car Rental "used to be one of the flagship accounts that EDS used to wave in front of people," said Susan Scrupski, a consultant at Technology & Business Integrators in Woodcliff Lake, N.J.

But from a financial standpoint, the National Car account "isn't that meaningful to [EDS's] business," said Moshe Katri, an analyst at UBS Securities in New York. □

Navigating telecom merger mania

▶ *Analysts advise escape clauses to void the deal if service suffers as a result of a buyout*

By Matt Hamblen

THE BIDDING WAR for MCI is the latest example of telecommunications merger mania, a phenomenon that pleases stockholders who stand to make a windfall. But how does a network manager traverse the alien landscape of deregulation?

Industry analysts recommend that managers who buy Internet, telephone and data services put an escape clause in the contract that voids the deal if the carrier is bought out and service begins to lag.

Managers in large enterprises also should consider setting up a formal bidding process that will push vendors to cut costs and add service plums, analysts said.

"Mega-network users might spend millions of dollars per month for services. If they can negotiate savings of half-a-cent per minute that becomes very loud noise," said Ken McGee, an analyst at Gartner Group, Inc. in Stamford, Conn.

Industry analysts recommend that managers in large enterprises also should consider setting up a formal bidding process that will push vendors to cut costs and add service plums

UNFAZED

Several telecommunications managers said they are amazed but largely unaffected by the enormous bids by WorldCom, Inc. in Jackson, Miss., and, more recently, GTE Corp. in Stamford, Conn., to buy Washington-based MCI Communications, Inc.

"The buyout bids aren't a big factor to us," said Jay Saporta, a communications manager at Syncor International Corp. in Woodland Hills, Calif. "If WorldCom buys MCI, I think it will be good service for us."

GOING WITH MCI

Saporta signed in February for both local and long-distance phone and data service from MCI, replacing Pacific Bell in San Francisco as his company's local provider. "Pac Bell wasn't very accommodating" when Syncor wanted to move its offices and keep the same phone numbers for its corporate employees, but MCI was willing to do so, he said.

The changing telecommunications world means managers must "have more responsibility to evaluate and negotiate" service offers by providers, said William Lazarus, director of telecommunications at Horizon/CMS Healthcare Corp. in Albuquerque, N.M. "It means more fact-finding."

But simply because a carrier is bought, that isn't reason enough for a customer to have the right to switch a service provider, said Rebecca Wetzel, an analyst at TeleChoice, Inc. in Upton, Mass. But an escape clause could be valuable if billing and administrative problems develop with the new carrier.

"Billing and administrative issues can be just as annoying as service outages," Wetzel said.

ESCAPE HATCH

McGee said some of his clients at large companies have included language in service contracts that permits them to reconsider the contract if more than 25% of the provider's stock is acquired by another company — regardless of whether services or costs are affected.

But he estimated that less than 20% of the 1,000 largest U.S.-based enterprises have a formal bidding process with carriers. Of those that do, he said savings of 10% to 25% have been attained.

McGee also believes telecommunications managers shouldn't sign nondisclosure agreements with carriers. They should be free to discuss the rates they pay with other customers. If they find a better rate, they can put pressure on a carrier to cut the rate. "What good is creating a competitive market if you can't benefit?" he said. □

TELECOM BASICS

- Ask long-distance carriers to document how they set rates based on prevailing government-approved tariffs, then compare those rates with the new ones.
- When considering alternative local providers, evaluate their plans to assign a customer one number for multiple devices.
- By 1999, network managers should divert 10% of their long-distance phone and data service to a regional phone company to test its reliability as a long-distance provider.

Source: Gartner Group, Inc., Stamford, Conn.

GTE bids for MCI

GTE last week became the third bidder for MCI, following the lead of WorldCom and British Telecommunications PLC.

MCI officials will meet with both GTE and WorldCom. Observers said GTE's $28 billion cash offer and WorldCom's $30 billion stock offer diminish hopes for BT, which has offered $18 billion for the 80% of MCI it doesn't already own.

GTE, because it was never part of AT&T and wasn't subject to deregulation policies, has built enormous pockets of local service and important long-distance business. GTE recently purchased BBN Corp. in Cambridge, Mass., a component that makes it a good match with MCI's Internet backbone, said Rebecca Wetzel, an analyst at TeleChoice, Inc. in Upton, Mass.

"MCI has the robust Internet infrastructure, and BBN is leading-edge in Internet service and [research and development]. And if the two are combined, that could help in providing customer services such as videoconferencing and quality of service" guarantees, Wetzel said.

— Matt Hamblen

Management tools too advanced for installed base of PCs

▶ *Problem is older PCs don't work with software designed for newer desktops*

By April Jacobs

INTEL CORP. and other vendors continue to release increasingly sophisticated desktop PC management tools. But some corporate systems managers say their older hardware can't take advantage of the new, money-saving features.

Santa Clara, Calif.-based Intel this week plans to announce a new version of its LANDesk Management Suite. In the past two weeks, it has enhanced its LANDesk Client Manager and Server Manager products.

The problem is that products such as Intel's LANDesk were designed to run on hardware that complies with Version 2.0 of the Desktop Management Interface (DMI) standard, just finalized this year, said Roger Kay, an analyst at International Data Corp. in Framingham, Mass.

So corporations may have thousands of older PCs that don't comply with DMI 2.0 and don't work correctly with software intended to manage more sophisticated desktops, Kay said.

Features of Intel's LANDesk Client and Server Manager

- Remote troubleshooting and notification
- Remote wake-up and reboot of desktop clients
- Support for Windows 95 and NT 4.0

Intel has more than 20 OEMs signed up to ship Version 3.1 of its LANDesk Client Manager — a software tool that monitors desktops from a remote location, allowing information systems managers to troubleshoot and configure systems.

The best practices in desktop management, such as remote management and preventative measures, could cut a company's desktop support costs by $5,000 to $7,000 per year per PC, Kay estimated.

But some users said although they like the management features of products such as Intel's Client Manager and Microsoft Corp.'s Zero Administration for Windows, their older hardware can't take advantage of them.

"I wish we were able to manage our PCs at a level they are offering, but we can't because our installed base of users doesn't have the level of technology needed to do it," said one IS manager at a national broadcast entertainment network.

"So while it's great that Intel's coming out with this, you have to ask what you're supposed to do with all your legacy hardware," said the IS manager, who requested anonymity.

STANDARDS NEEDED

Another user said there needs to be more standardization and maturity in the desktop management products before he will invest in the technology.

"We do use software distribution software. And we are looking at a lot of the management products out there, but the field is still somewhat immature," said David Blakley, a computer systems manager at Genencor International, Inc. in Palo Alto, Calif. "Still, we'd like to put some of this in place, because it would make life a lot easier."

As part of the LANDesk suite of products, Intel also offers LANDesk Configuration Manager, which lets users deploy application software and operating systems across the network from a remote and central location to NetPCs and other managed PCs.

LANDesk Server Manager will be available for $695. Customers with previous versions can upgrade for $349. Server Manager complies with the DMI 2.0 specification. □

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Quick fixes are of limited use in detering forced diet of spam

By Barb Cole-Gomolski

SHORT-TERM FIXES abound, but there is still no surefire way to prevent unsolicited bulk E-mail, or spam, users and analysts said.

The Internet Mail Consortium, an industry group in Santa Cruz, Calif., last week published a report on its World Wide Web site (*www.imc.org*) indicating that although spam filters are proliferating, they only go so far.

MESSAGING STRATEGIES

And there are no federal laws to deal with spam, even though the topic has started showing up on legislators' radar screens.

WHAT A DRAG

Information technology professionals are concerned about the drag that spam puts on electronic-mail systems and the time that workers waste dealing with it. Corporations also want to avoid spoofing, in which a spammer can bounce mail off the corporate server and make the company appear to be the originator of the E-mail.

"The kind of weak filtering that is currently out there is so easy to circumvent, it's almost not worth it," said Paul Hoffman, director of the consortium and co-author of the report. Stronger filtering would work better, but it also would result in a company losing some of its legitimate messages, he said.

"You cannot filter this stuff very effectively," agreed Eric Arnum, editor of the "Electronic Mail and Messaging Systems" newsletter in Washington. About all you can do is reject messages from known spammers, he explained. And that is only a temporary fix; spammers frequently change their domain names or bounce their mail off others' servers.

Information systems managers consider spam a growing problem.

"We haven't been blitzed or anything, but [spam] is certainly costing us money," said Mike Gentile, vice president of IT services at Zurich American Insurance Group in Schaumburg, Ill.

The insurance giant is charged per bit, so spam E-mails drive up its Internet service provider charges. Because the company only recently opened up its corporate E-mail system to the Internet, it hasn't yet tried filtering. "I can foresee a time when we filter Web site access and E-mail through a proxy server," Gentile said.

Jeff Schnable, director of infrastructure technologies at Unilever North America Foods in Englewood Cliffs, N.J., said spam will proliferate as more users try to consolidate their multiple E-mail boxes in their company in-box.

Hoffman said IS managers should make sure any filtering they do doesn't lose valuable E-mail. "They should also be talking to their lobbyist in Washington and telling him or her to press Congress" for a bill that would prevent spammers from using fraudulent headers or domain names, he said. □

HOW TO FIGHT SPAM

1. Use mail filters to automatically dump messages with headers that contain hints of spam, such as "xxx," "make money" or "!!!"
2. Sort incoming mail into folders to make deleting spam easier.
3. Don't respond to spam, even if the author promises to remove you from the mailing list.
4. Use dual E-mail accounts – one for public surfing, one for key correspondence with colleagues and family.
5. Use spam blockers provided on America Online and CompuServe.
6. Don't fill in the "member's profile" on AOL. Spammers troll those for leads.
7. Don't fill in registration forms at Web sites unless the purveyor promises not to sell or exchange your name and information.
8. Don't complain about spam in Usenet newsgroups or on mailing lists. Doing so wastes more resources.
9. Complain to Congress.
10. Don't counterspam the offender's mailbox. The reply address usually doesn't work.

Source: Adapted from *Online Marketing Handbook* (Van Nostrand Reinhold, $24.95) by Daniel Janal

Users manage software via browser

▸ *Software, content controlled through intranet*

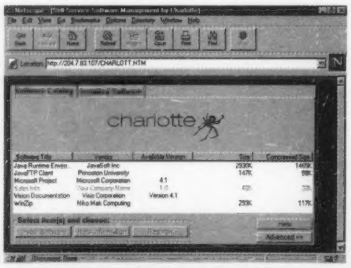
By Gordon Mah Ung

ELECTRONIC SOFTWARE distribution vendor Novadigm, Inc. last week announced a product line called Radia Software Manager that lets end users install, repair or uninstall corporate-approved software or content via their intranet browser.

Beta testers said the Radia line looks promising and could save information technology departments time, energy and network bandwidth and give end users more control over their software updates.

The software manager "empowers the user to check if something is broken or corrupt, or if something is missing from the registry," said Paul Syrvalin, a LAN manager at Alltel, Inc. in Little Rock, Ark.

That should help cut calls to the help desk, said Syrvalin, who manages about 2,500 PCs. He is just beginning to beta-test the product.



Benefits of Novadigm's Radia Software Manager include quicker updates and repairs, and centralized configuration

Syrvalin said Radia will benefit the growing hordes of mobile users who can check from home if they need a software update.

If they don't have the bandwidth or time then, they can wait until they plug their laptop in to the corporate network and download the update.

CUSTOMIZATION

Systems administrators could use Radia Software Manager to customize package applications before publishing them on a server.

Norman Vadnais, a desktop management specialist at Kaiser Permanente Health Plan, Inc. in Pasadena, Calif., said Radia gives managers granular control over how a particular application is configured before downloading.

MORE CONTROL

"Say we have a user who wants to put WinZip on their machine. Using Radia, we can control how WinZip is installed on the machine so it won't screw up the machine," Vadnais said.

Waverly Deutsch, director of computing strategies at Forrester Research, Inc. in Cambridge, Mass., said Radia goes beyond distributing code. "Any digital asset can be managed through this architecture," Deutsch said.

And because Radia lets end users uninstall applications when they are finished, more employees get a chance to use the software without exceeding the user limits of licensing agreements, she said.

Radia Software Manager, expected to be available in December, will support Windows NT and Windows clients with World Wide Web browsers.

The initial license fees start at $15,000 for a server that supports 100 subscribers.

Each additional subscriber costs $50.

Novadigm, in Mahwah, N.J., expects Unix and Mac OS support to be available early next year. □

Tools warn of slow 'net delivery

By Patrick Dryden

ON THE INTERNET, nobody can hear users scream about poor performance.

But now, whoever is responsible for browser-based applications can get early warning before employees on an intranet and customers on the World Wide Web complain via telephone or flame mail.

Start-up VitalSigns Software, Inc. in Santa Clara, Calif., this week will launch two monitors that measure all aspects of Hypertext Transfer Protocol exchanges directly from a user's perspective instead of indirectly from the usual network and server tools.

"Pieces like routers and servers may look fine, yet the end-to-end connection is broken or behaving slowly. We need to know when service degrades before it irritates our customers," said a beta tester, the vice president for online financial services at a bank, who asked to remain anonymous.

VitalAnalysis, a server that summarizes performance by each component between a browser and its target, is available now. Optional VitalHelp software, due in December, enables help desk staff to correlate and fix user problems.

Each starts at $10,000 and requires Net.Medic, a browser add-on that reports performance information to the local user and to the central servers.

"There's nothing close on the market yet for monitoring client-side activity, without ripping open an application to measure end-to-end performance," said Ray Paquet, an analyst at Gartner Group, Inc. in Stamford, Conn. But Paquet cautioned that the year-old VitalSigns must prove its ability to support many customers and to monitor lots of users without sapping network bandwidth or overloading managers with statistics. □

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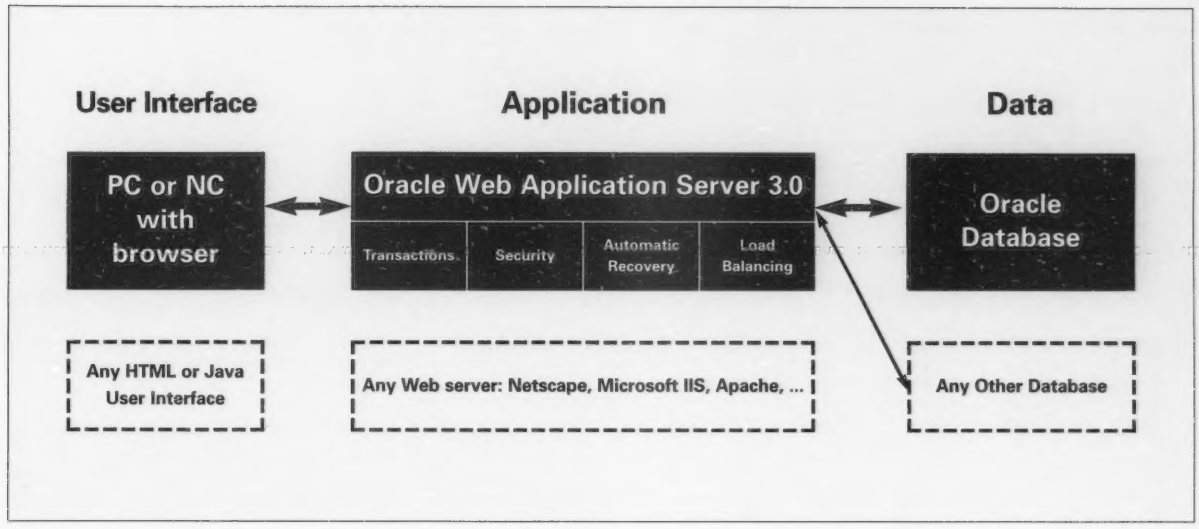

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FRANKLY SPEAKING

Suit or nerd?

FRANK HAYES

A NERD OR a suit? An IS chief who's a technologist or one who's driven by the bottom line for business? The debate over that choice is raging at the highest levels of the punditry pyramid these days.

One side says the need to align information technology and business goals makes a business-oriented IS boss essential.

The other side recites horror stories about IS blundering horribly because the boss just doesn't understand the technologies. Clearly, this is a job for a nerd.

So which will it be: nerds or suits?

Here's the news, folks: Your next IS boss *will* be a business type.

Look, do the math. More and more CIOs are businesspeople first. The reason is simple and unsubtle: Top management consists of businesspeople, and they want one of their own in charge of something as important as IS.

Never mind that the technologies in a large organization's IS shop range from JCL to Java, that it's getting more complicated by the week, and that handing some generic executive a subscription to *Computerworld* and control of your IS capabilities just about guarantees catastrophe.

After decades as a backwater spin-off of the accounting department, IS is now considered a hot, valuable, business-critical function by the big bosses. That's a tribute to all the technical people who worked hard to prove IS could deliver technology tuned to the specific needs of the business.

To upper management, IS is too important to trust to a techy.

But in the eyes of upper management, it also makes IS too important to leave in the hands of someone who came up through the technical ranks.

So you *will* get a suit. Think that's bad news? It doesn't have to be. There can be some real advantages to having a suit for a boss — if that suit can master what IS people do and how they do it.

The best, smartest, most successful IS executives I meet usually start our conversations by saying, "I'm not a technical person, but . . ." and then proceed to describe, clearly and in detail, exactly what their shops are working on.

They clearly understand the technical issues and available technology — and they also grasp the realities of implementing real systems and dealing with real vendors.

ADVISERS' HELP

Could IS executives step in to replace some random techie on their staffs? Not a chance. But they can speak the language, they understand the mind-set, and they recognize the strengths, needs and limitations of IS people.

In other words, they're the kinds of bosses any sane IS shop wants.

Successful IS suits don't get this way by accident. They beat their brains out deciphering technical gobbledygook. They listen carefully to what techies have to say and trust that expertise — even when, sometimes, the techies' recommendations get a thumbs-down.

And they get lots — *lots* — of help from their technical staffs.

They've usually got another advantage: Because they came from sales or finance or manufacturing, they know the language, mind-sets and needs of users, too.

Think that's not a big deal? How happy are your users? And how many of their complaints boil down to collapsed communication between IS and the other parts of the organization?

And because they've been successful in a "pure" business function, these suits have the clout they need to make IS successful, too — to deal with high-level politics, fight for budgets and projects, cut deals and stare down other executives.

That's clout no up-from-the-ranks techie could ever garner. Clout IS can never acquire without a suit at the top.

True, a tech-savvy suit may never quite satisfy your desire for a true nerd for a boss. But you may just discover that having a businessperson as IS chief is pretty good news after all. □

Hayes is Computerworld*'s staff columnist. His Internet address is frank_hayes@cw.com.*

SHORTS

Sun earnings disappoint

Sun Microsystems, Inc.'s first-quarter earnings fell short of analysts' expectations despite record revenue of just under $2.1 billion. Net income for its quarter ended Sept. 28 was $108 million, or 27 cents per share, down from $123 million, or 32 cents per share, for the same quarter last year, Sun officials said. Analysts polled by First Call had estimated Sun's earnings would reach 44 cents per share.

Microsoft expands support

Microsoft this week is expected to announced a support service in conjunction with Hewlett-Packard Co. and Digital Equipment Corp. The service, aimed at midsize companies, gives users support on up to 75 incidents a year at a price estimated at less than $30,000.

IBM shuffles PC group

IBM is reorganizing its consumer computer division. The move will initially mean bringing the development team for the consumer PC division into the commercial desktop group. IBM wouldn't comment on whether the reorganization will lead to layoffs, although analysts predict it will.

Congress allots $23M for 'net

Congress has earmarked $23 million to create advanced online communications 1,000 times faster than today's Internet. The money comes from the Internet infrastructure preservation fund and is in the federal budget now before President Clinton. The fund was created five years ago using 30% of the Internet domain registration fees collected by Network Solutions, Inc. in Reston, Va.

Microsoft meets with Nader

A Microsoft representative last week voiced concern about a conference planned by Ralph Nader to examine the Redmond, Wash., software giant's business practices [CW, Oct. 13]. In a meeting with Nader's Consumer Project on Technology group, lobbyist Jack Krumholtz asked about the motivations of the conference organizers and expressed concern that the event would just be a Microsoft "bashing session."

Netscape, AOL E-mail service

Netscape Communications Corp. in Mountain View, Calif., and America Online, Inc. last week announced plans for a free messaging service. The service, called Netscape's AOL Instant Messenger, is due out by year's end. Instant messages will be routed through America Online's network and will be available to users of Netscape's Navigator browser and Communicator groupware client.

Compaq offers Web sales

Compaq Computer Corp. is going direct. The Houston-based computer maker is selling products through CompaqDirect, a World Wide Web site (*www.compaqdirect.com*) that also sells computers from other vendors. The move, which follows Compaq's move to a partial "build-to-order" manufacturing model, is part of the company's ongoing effort to compete with direct sellers such as Dell Computer Corp.

Solectron grabs Baldrige award

The U.S. Department of Commerce has presented its Malcolm Baldrige National Quality Award to Solectron Corp. in Milpitas, Calif., for the second time in six years. Solectron has 18,000 worldwide employees and provides customized electronics manufacturing services to equipment makers.

Cisco to tie data, voice, video

Officials at Cisco Systems, Inc. said this week the company plans to lay out its strategy for integrating voice, data and video traffic on users' current data networks, a move that can save users money by eliminating parallel networks. The San Jose, Calif., internetworking giant said its announcement will include at least one new product but declined to provide details.

Wang wins $539M fed contract

Wang Government Services has won a $539 million, five-year contract from the U.S. Immigration and Naturalization Service for desktop management and network support. Wang, in Billerica, Mass., will oversee more than 24,000 desktop seats.

SHORT TAKES **GemPlus Corp.** in Montgomeryville, Pa., announced the first Java-based SmartCard implemented on a 32-bit RISC processor last week. . . . **Lockheed Martin Corp.** contracted to buy $60 million worth of **Hewlett-Packard Co.** Unix and Windows NT-based enterprise servers, departmental servers and workstations. . . . Westboro, Mass.-based **Banyan Systems, Inc.** will announce Banyan Intranet Protect, a Web server add-on that uses the company's StreetTalk directory to control access to information stored on a corporate intranet. . . . Firewall software vendor **CheckPoint Software Technologies Ltd.** in Redwood City, Calif., posted earnings of $12 million on $22.4 million in revenue, a 219% jump in profits compared with last year's third quarter.

Coding contest showcases student stars

▶ *Talented collegians get a head start in securing plum IS jobs*

By Julia King

A COAST GUARD rescue team knows only the general location of a ship stranded on the high seas. How can it pinpoint the exact location of the vessel and map out the most direct route to reach it before it sinks?

A new long-distance telephone company needs a calling circle plan in a hurry. You must write the program using only a log of phone calls among the company's customers.

Those are the kinds of computing problems student programmers will tackle in the ACM Association for Computing's 22nd annual International Collegiate Programming Contest, which kicks off in the U.S. this week at Rice University in Houston. Only one three-student team will win this year's grand prize of several thousand dollars in scholarships. But virtually all of the more than 3,000 contestants can expect to be deluged with letters and calls from companies that seek the best and the brightest computer science graduates.

Tips from former ACM contestants

- ▶ **The problems look deceptively simple. Don't be fooled.**
- ▶ **Practice on problems from previous contests, which are available from ACM. *(www.acm.org/contest)***
- ▶ **Brush-up on graph theory and mathemetical geometry.**

"The contest was definitely a huge part of getting this job," said Vicki Givens, 23, a two-time ACM contestant and now a software engineer at IBM's Government Industry Division in Houston. Givens graduated from the University of Oklahoma in May.

"As far as other job interviews I had, they always asked me about the contest and were very interested in it, because it shows team skills and motivation beyond the classroom," she said.

During the five-hour contests, teams of three students each are given eight identical problems to solve. The catch is that each team is given only one computer to complete the assignments.

"That makes time management a real issue, so teamwork and team chemistry are both very important" — just as they are on the job, said Kris Rudin, a former contestant and now vice president of Aurora Development Group, Inc., a Web site developer in Spokane, Wash.

The one-computer-per-team rule goes back to the contest's beginnings in the 1970s "when equipment was expensive, and you had to share," explained Bill Poucher, a professor of computer science at Baylor University in Waco, Texas, and contest director.

But after equipment costs dropped, ACM opted to keep the single PCs because "one of the problems we face in academia is that we tend to develop individuals rather than an individual's ability to work with others. Having a single machine forces that issue," he said.

Poucher said about 1,000 teams will compete in regional contests. The 50 teams that solve the most problems in the fewest attempts and least amount of time will meet in Atlanta in February for the World Finals, he said. □

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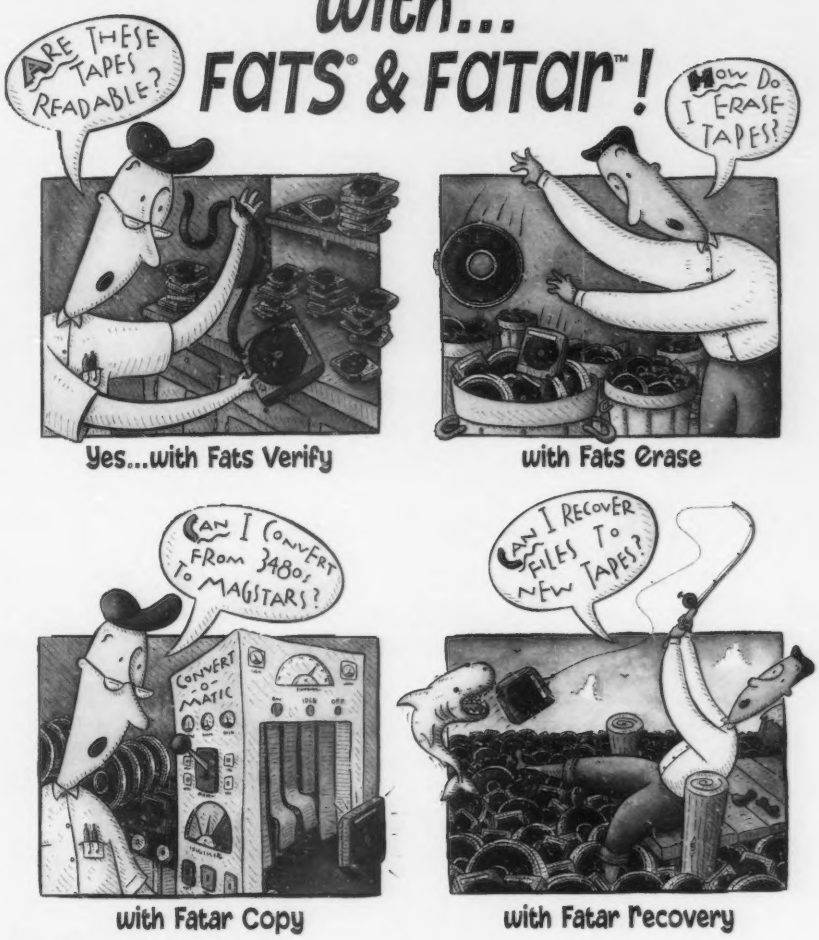

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Talent Alliance members have yet to swap workers

▶ *Companies share skills and information but not employees*

By Julia King

ABOUT 1 MILLION employees at more than a dozen member companies have been given access to Internet-based skills assessment tools and training by the 7-month-old Talent Alliance.

But the cross-industry consortium of companies that banded together in March to tackle the information technology skills gap and other workforce issues has yet to implement its planned program for sharing technical and other key employees [CW, March 17].

"It's taking a little longer than we thought because a couple of our member companies anticipated large-scale restructuring, but that's not happening yet," said Jeannette Galvanek, a vice president of human resources at AT&T Corp. and president and CEO of the Morrisville, N.J.-based Talent Alliance.

The Talent Alliance was formed in the spring as a way for companies to cross-train workers and loan one another key employees as their project needs dictate. On the employee side, the Alliance's role is to provide training, job counseling and a talent/job matching service.

TALENT ALLIANCE

Headquarters: Morrisville, N.J.

Founded: March 1997 to address changing workforce patterns

Member companies: 14, including AT&T, UPS and Unisys. The companies share training and other resources, including employees

Benefits: Employees get online access to job listings, career counseling and skills training

Alliance members said they thought it would take time for the organization's ideas of cross-training and sometimes cross-employing workers to be adopted on a large scale. Most members are still figuring out how to implement them.

"It's one of those things that's a culture change and will evolve over time," said Kris Lang-Shasky, manager of workplace effectiveness at Ceridian Corp., a $1 billion information services company in Minneapolis.

OTHER RESOURCES AVAILABLE

But member companies are tapping in to other services provided by the Alliance, including a job and resume-posting service and various training resources.

Unisys Corp., for example, is using the group's network-based skills assessment programs and other career and financial planning tools as part of its enterprise-wide Career Fitness Center.

"In today's job market, the reality is that everybody's virtually a free agent, and everybody's responsible for their own career. This is a vehicle for employees to keep their skills marketable," said Jack Hughson, vice president of human resources at Unisys' federal systems division in Fairfax, Va.

Ceridian is sending job openings to Talent Alliance's jobs database. Theoretically, employees at all member companies could then view the database of available jobs at other member companies. But members are also free to set their own policies about access to job information.

At Ceridian, for example, access will be granted only to employees who are "officially displaced," rather than to all employees, Lang-Shasky said. □

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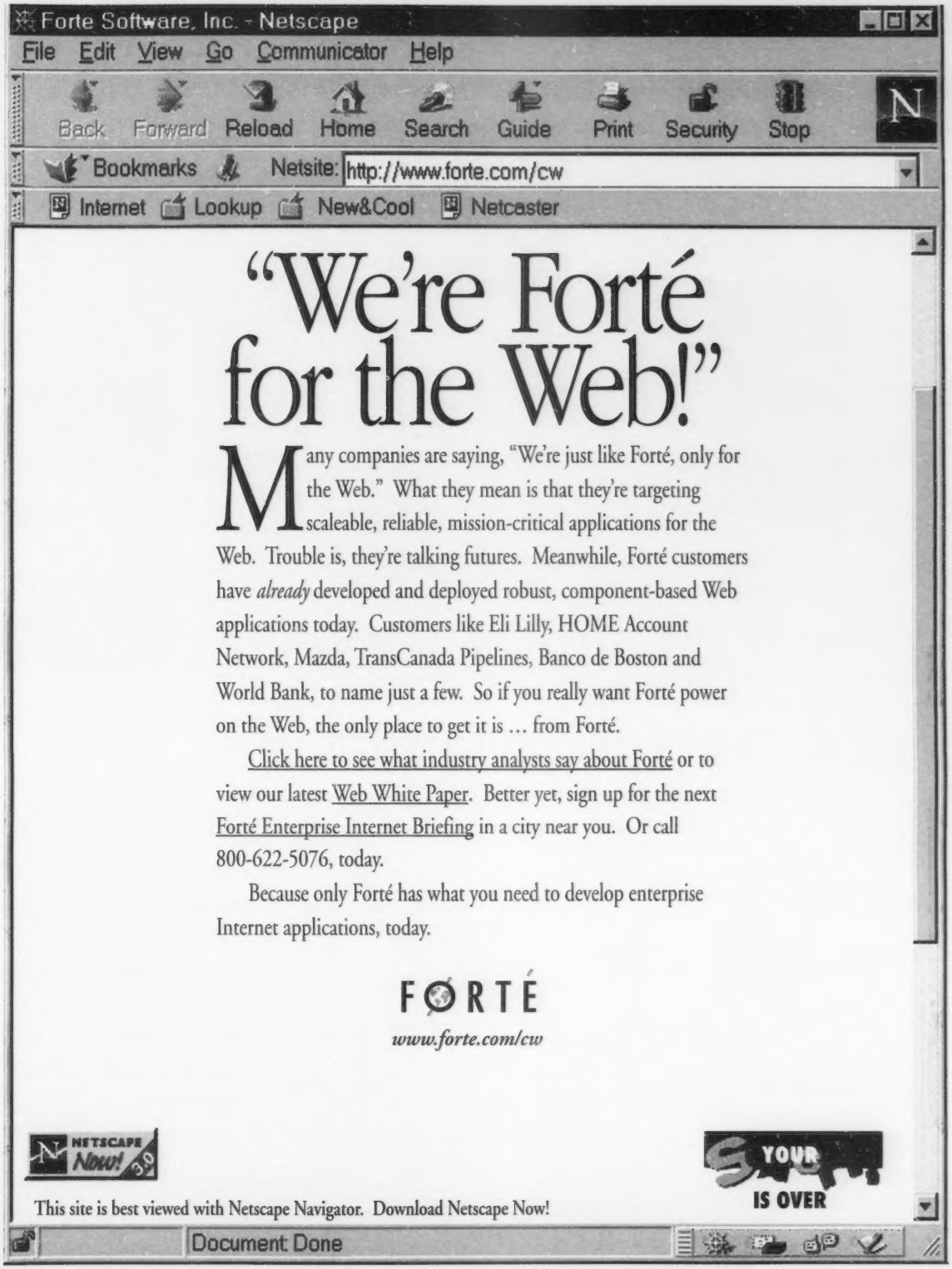

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TRBA

VIRTUAL WORKPLACE

Who pays for telecommuting?

By Kim Girard

AMERICAN EXPRESS CO. picks up the full tab for office furniture, a computer and the monthly telephone bill for employees who telecommute several days each week.

In exchange, Amex's telecommuters — 600 of the company's 72,000 employees — often sacrifice exclusive rights to coveted desk space within the financial-services company's increasingly crowded offices.

"Just about every major facility we have is bursting at the seams," said Joel Ratekin, a director in space planning at American Express Real Estate Services in New York.

Laptop or PC

Around $1,000 to $4,000

THE DETAILS

Despite the practice at Amex, the extent to which companies foot the telecommuting bill varies widely. It often depends on employee demand and whether alternative work arrangements are a corporate priority.

"Generally, employees are picking up the expenses," said Gil Gordon, president of Gil Gordon Associates, a telecommuting consultancy in Monmouth Junction, N.J.

The tab includes a one-time cost of between $200 and $2,000 for an office desk and between $200 and $1,200 for an ergonomic chair. It also includes the cost of a laptop or PC and ongoing phone charges. In some cases, a printer or fax machine is also included.

In exchange, the company can expect to save between $1,500 and $5,000 per year in real estate costs per desk that is freed up by a telecommuter, Gordon said.

At Merrill Lynch & Co., where being perceived as an employer of choice is driving telecommuting and flexible scheduling, the company pays for a laptop and docking station or a PC, as well as a regular phone line, an Integrated Services Digital Network line or a frame-relay connection. But employees pay for furniture.

Basic printer

$350

PHONE BILLS

Of all the expenses, phone bills can be the most difficult to control, especially if the user must be connected to the network for many hours each day.

"When you get that $2,000 phone bill for the month, you say, 'I've made a mistake. We have to change it,'" said Camille Manfredonia, vice president of alternative work arrangements at Merrill Lynch.

Manfredonia said her office often consults with the phone company to get a service that better suits an employee's use.

Modem

$100 to $200

MONEY MATTERS

At Novartis Pharmaceuticals Corp. in East Hanover, N.J., requests for funding for telecommuting is considered on a case-by-case basis, according to human resources manager Laurie Pellegrino.

The company may use telecommuting as a bargaining chip when recruiting a coveted job candidate, she said. In other cases, an employee may be required to share the cost of working at home, depending on how well a particular department is funded for information systems expenses, Pellegrino said.

As telecommuting programs evolve and a cross-section of departments within firms work together on policies, expenses tend to shift back to the employer, said Ellen Reilly, president of the New York Telecommuting Advisory Council.

"It's been challenging to get investment in it," Reilly said. □

Telephone line, ISDN or frame-relay connection

$15 to $1,500 per month, excluding usage

Hewlett-Packard's combination fax, printer and copier

$600

Storage management future gets better for users

▶ *Companies introduce tools to help with expected deluge of data*

By Tim Ouellette

BY EARLY NEXT year, users will gain two new tools to help manage their widespread storage systems from a common interface.

Veritas Software Corp. on Wednesday plans to unveil Storage Manager, a central interface that links to Veritas' line of open systems storage tools and monitors users' disk and tape subsystems. The Mountain View, Calif., vendor also will announce related modules that offer performance management and let users predict storage capacity and performance needs.

MAINFRAME STORAGE

And on the mainframe side, Boole & Babbage, Inc. (B&B) last week announced SpaceView Explorer, a central Windows 95/Windows NT interface to B&B's SpaceView mainframe storage management tools. The San Jose, Calif., company plans to support Unix and Windows NT storage early next year.

The integration efforts come as storage turns into a major portion of the typical server purchase or even a separate purchasing decision altogether. Analysts said users are slowly realizing that they need a way to get a handle on these growing and often widespread storage resources, especially for open systems.

WHAT'S IN STORE

With its new Storage Manager, Veritas hopes to help users plan for the coming deluge of data

Total terabytes of storage shipped

*Projected

Source: International Data Corp., Framingham, Mass.

For example, Wells Fargo & Co. wants to make storage a system-level service that is centrally managed and organized, something that has been lacking in the open systems world.

"The integrated view [with Veritas' Storage Manager] is big for us," said Terry Johnson, vice president of Unix and Oracle Corp. systems at the San Francisco financial giant. "We have 30 to 35 arrays right now, and overall management of this has been a complete nightmare."

PANORAMIC

Storage Manager is meant to give users a sweeping view of storage, with ties to databases, tape devices, disk arrays and Veritas tools such as the Veritas File System, Hierarchical Storage Manager, Volume Manager and NetBackup. The software will provide alerts via intelligent software agents tied to those other tools and devices.

B&B's StorageView Explorer links with the company's Command/Post systems management suite.

Veritas will provide an application programming interface to tie in to leading network and systems management products.

With Storage Manager, Veritas will offer Storage Advisor, a performance management tool that can recommend how to tune and configure storage resources for certain applications.

"We are interested in benchmarking different storage devices with the Veritas performance management tools," said John Barton, a senior systems administrator at Deluxe Corp., a Shoreview, Minn., printer of personal checks.

Analysts said users are slowly realizing they need a way to get a handle on these growing and often widespread storage resources, especially for open systems.

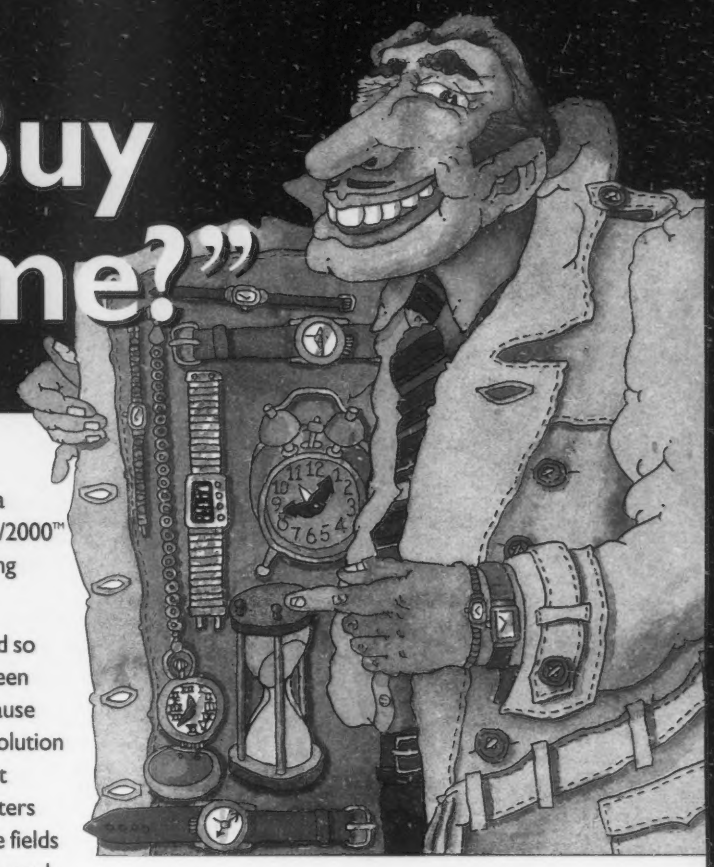
Another module, Storage Planner, will let users forecast storage sizing and predict the effects of mirroring or RAID on a storage environment, for example. That will become more essential as users try to map out how much storage they will need for fast-growing applications such as data warehousing.

"That can be helpful, especially if someone has 50 to 60 servers. Then you can play out all the what-if scenarios involved," said Anders Lofgren, an analyst at Giga Information Group in Cambridge, Mass.

Storage Manager will be available in January. Pricing will start at $1,500 for low-end servers. Pricing for StorageView Explorer starts at $5,000 for five user seats. □

& **Network technology becomes key to storage scalability. Page 67**

"Psst... Wanna Buy Some Time?"



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Study showing E-mail slowdown catches flak

▶ *Users, others express doubts about findings*

By Barb Cole-Gomolski and Matt Hamblen

IS DELIVERY of E-mail on the Internet slowing down?

A new study says yes, but interviews with users, Internet service providers and the Internet Mail Consortium indicate otherwise. The consortium even questions the methodology of the study from Inverse Network Technology, Inc. in Santa Clara, Calif.

There is, however, concern among some information systems managers as to what effect Internet mail delays might have as more companies tie electronic mail to electronic-commerce applications.

"Personally, I'd be concerned if I sent my credit-card number down the line [via E-mail] and learned that it was somewhere on the 'net instead of being delivered," said Tim Crawford, technical project manager at National Semiconductor Corp. in Santa Clara, Calif.

GROWING FAST

Companies increasingly are relying on Internet mail because it is more scalable and less expensive to manage than proprietary systems. According to International Data Corp. in Framingham, Mass., the number of Internet E-mail users grew 727% last year to 11 million worldwide. There are still more users — 17 million worldwide — on LAN-based E-mail systems, but that segment grew by only 16% last year.

The Inverse study of 12 Internet service providers showed that the percentage of Internet E-mail delivered in less than five minutes fell from 92% in April to about 81% in September. The study attributed the delays to downed or backlogged servers designed to receive incoming E-mail at service provider locations. Inverse mailed more than 200,000 messages to the 12 Internet service providers during the past six months as part of the study.

Paul Hoffman, co-chairman of the Internet Mail Consortium industry group in Santa Cruz, Calif., questioned how well Inverse's study mirrors the conditions found in most large companies.

"Inverse is testing messages sent from one [Internet service provider] to another, and that doesn't match the average corporate customer's experience," Hoffman said. Internet E-mail sent from company to company would be faster, he said. That's partly because Internet service providers may operate for days with a downed server, but that "never happens in the corporate environment," Hoffman said.

As a result, the Internet Mail Consortium — which includes most of the major messaging vendors — has decided to do its own testing of E-mail over the Internet and hopes to publish the results sometime next year.

Users, meanwhile, said they have seen some delays with Internet mail, but either they aren't sure what is causing them or have traced them back to their own server gateways.

"We've had [just a handful of] complaints that it can take hours [to deliver an Internet mail message], and that can stretch into the next business day," said Mark Chrobak, a senior systems analyst at Northwestern Mutual Life Insurance Co. in Milwaukee.

At New York-based Joseph E. Seagram & Son, Inc., delays involving incoming Internet E-mail were traced to a gateway that hooks the company's Lotus Development Corp. CC:Mail network to the Internet, according to Kevin Coleman, implementation specialist.

One company that tracks Internet mail performance, Texas Instruments, Inc. in Plano, Texas, reports an average message delivery time of 20 seconds. But the company is unique in that it runs a native Simple Mail Transfer Protocol mail backbone, so messages aren't passed through a gateway.

For their part, Internet service providers said they aren't getting complaints about the delivery times of E-mail. However, although they denied getting complaints, only one service provider supplied its own figures on how well it is performing.

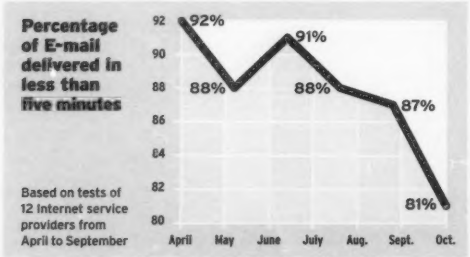
"I think we're performing well," said Ted Creech, a spokesman for BellSouth.net. The company is concerned, though, that increasing spam on the Internet is slowing down E-mail. Creech said BellSouth is adding servers to meet growth in dial-up subscribers and dedicated access business users.

Mike McQuary, president of Mindspring Enterprises, Inc. in Atlanta, said the Inverse numbers don't correlate with the Internet service provider's own findings about E-mail delivery rates, but he wouldn't say whether Mindspring's rates are better or worse.

"Overall, there's a lot more E-mail traffic, and there's more spam," McQuary said. "If there is some degradation, I'm sure that added traffic is the culprit, and lots of [Internet service providers] will have to get additional servers."

Whether Internet mail takes five minutes or two minutes, it is particularly likely to seem slow to users migrating off mainframe systems, where sub second response times are common, said Joe Jesson, staff consultant at Amoco Corp. in Chicago. □

& **Sun rolls out an E-mail server based on Internet protocols. Page 57**



Source: Inverse Network Technology, Inc., Santa Clara, Calif.

AT&T

CONTINUED FROM COVER 1

for AT&T's data networking services group.

The services will be large bandwidth pipes over an Asynchronous Transfer Mode backbone network that users can tie their campus LANs to using high-speed network access equipment at their sites. AT&T wouldn't say if it will provide the access boxes as well.

"It will be rolled out early next year," Lueckenhoff said. "It will let users link LANs at speeds up to 100M bit/sec."

Analysts predict the 100M bit/sec. offering will be popular with users because most already use 100M bit/sec. Fast Ethernet or Fiber Distributed Data Interface (FDDI) backbones to link buildings on their campuses.

"There's certainly a class of customers who need this service capability and have been waiting a long time for it," said Christine Heckart, an analyst at TeleChoice, Inc., a Verona, N.J., consultancy. "The financial industry, among others, would be [especially] attracted."

One user expressed interest in the transparent LAN services, if the price is right.

"It sounds like a very appealing offering, especially since users running applications on high-speed LANs at 10 and 100M bits run into a bottleneck at the WAN when faced with service at 64 and 128K bits," said Virgil Palmer, director of telecommunications and networks at Air Products & Chemicals Corp. in Allentown, Pa.

"The real issue with the services is how they're priced. That will determine our interest in the services."
– Virgil Palmer, Air Products & Chemicals

Lueckenhoff wouldn't say whether AT&T will offer services at speeds greater than 100M bit/sec. But he said the carrier is considering providing the services internationally as well, which piqued the interest of Palmer, who supports sites in 90 countries.

AT&T could be the first of the Big Three long-distance carriers to deploy such offerings; neither MCI Communications Corp. nor Sprint Corp. offer a branded 100M bit/sec. LAN interconnection service.

MCI has no immediate plans to offer FDDI transparent LAN service. Sprint, however, will deploy services in the first half of 1998 that will enable users to link LANs over WANs at LAN speeds, a spokesman said.

One key to service acceptance is pricing. AT&T could charge a flat monthly fee or base fees on actual usage, Heckart said.

"The real issue with the services is how they're priced," Palmer said. "That will determine our interest in the services."

AT&T will offer the LAN interconnection services over a 155M bit/sec. backbone network, Lueckenhoff said. □

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SNA FRAME RELAY SOLUTIONS

Is this a great time, or what?

MCI

High management support costs force delay in NT 4.0 migrations

CONTINUED FROM COVER 1

elected to reinstall their legacy network operating systems.

Windows NT 4.0, has far less horsepower than rival systems and can't handle as many users on one file server.

And because NT 4.0 lacks an enterprise directory on the scale of Novell Directory Services, it requires more administrators to manage it in large enterprises.

Additionally, its clustering capabilities lag behind Novell, Inc.'s IntranetWare and provide only baseline fault tolerance and redundancy.

But NT 4.0 is generally considered a more robust application server. Users complain that deploying Windows NT Server 4.0 costs more than expected for several reasons, according to Evan Bauer, an analyst at Giga Information Group in Cambridge, Mass.

Unlike Unix or NetWare, Windows NT Server can handle only one task well, so more systems are needed to support users, Bauer said.

'TEDIOUS AND COSTLY'

Worse, those servers require extra effort to manage. They lack remote control and scripting capabilities, and their instability requires rebooting once or twice per week, Bauer said, so engineers must visit every console frequently. "Management is tedious and costly," he said.

These revelations about NT 4.0 come as Microsoft launches a Windows NT 5.0 marketing campaign that claims the Active Directory will lower users' total cost of ownership by 50%. But it won't ship until the middle of next year.

"I can't sell Microsoft's promises to my boss," said Nora Miller, information systems manager at the Northwest Power Planning Council in Portland, Ore., which uses Digital Equipment Corp.'s Pathworks as its enterprise network operating system.

> "I was shocked to find that it was significantly more to upgrade to Windows NT."
> — Mike Crowley, Rich Products Corp.

"A wholesale migration to NT would easily double the cost of ownership compared to our Pathworks network," Miller estimated, based on internal cost studies that measured different price/performance ratios.

Phil Easter, a technology strategist at Greyhound Lines, Inc. in Dallas, said that according to his calculations, the cost of installing IntranetWare, including hardware, software and network management, would total about $410,000 for the first year. In contrast, he said, a similar implementation of Windows NT would top out at around $900,000 because of the need to install more servers and add-on management packages.

Easter also said the annual cost of management, maintenance and salaries for a Windows NT Server network would be around $670,000. That is more than double the $275,000 price tag for comparable IntranetWare maintenance.

Easter said he based his calculations on the available volume discounts his firm would get from Novell and Microsoft and the current technical specifications for IntranetWare 4.x and Windows NT Server 4.0.

A theoretical cost study conducted by Rich Products Corp. in Buffalo, N.Y., gave Chief Information Officer Mike Crowley the same rude awakening four months ago.

"I was shocked to find that it was significantly more to upgrade to Windows NT. As a result, we're sticking with IntranetWare for now," Crowley said.

"Our internal cost study showed it would cost us $300,000 in hardware alone to install a 600-client Windows NT 4.0 network vs. $80,000 for IntranetWare. It just doesn't have the firepower at this point," he said.

Other users, such as Matt Rice, a senior network manager at US-Trust Bank in Cambridge, Mass., and Tony Macaluso, director of information technology at Multicare Cos. in Hackensack, N.J., detailed the "hidden costs" of an all-Windows NT installation. They said Windows NT 4.0 requires more resources to achieve the same performance of rival platforms, although both have Windows NT Server installed as an applications server. Both praised its performance in that capacity. "I have 200 users attached to a single 466-MHz server running NetWare, and we have no problems. No way could I do that with NT," Rice said.

Macaluso, a longtime Banyan Systems, Inc. user, said his firm deploys StreetTalk for NT, running on top of Windows NT Server as its directory. That lets him designate a single network administrator to oversee 3,000 users at 60 sites nationwide.

> "If we were to use the Domain Name service in Windows NT 4.0, we'd need at least five dedicated network administrators."
> — Tony Macaluso, Multicare Cos.

"If we were to use the Domain Name Service in Windows NT 4.0, we'd need at least five dedicated network administrators," he said.

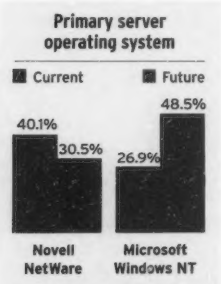
Neil MacDonald, an analyst at Gartner Group, Inc. in Stamford, Conn., concurred. "The worst thing you could do would be to yank out every legacy server [and replace it with Windows NT]. That's a very risky move that places too much faith in NT," he said.

Not so, said Rich Tong, Microsoft's vice president of Personal Business Systems marketing. He claimed that in order to get a true figure for Windows NT 4.0 cost of ownership, businesses must compare the cost of managing a Unix system and a NetWare server in tandem.

"That's because neither operating system can perform both the functions of [network operating systems] services and application operating system services as Windows NT Server does. We found that a single Windows NT 4.0 system today provides businesses with total cost of ownership that's 25% less than combination NetWare/Unix shops or OS/2 Warp Server/AIX shops," Tong said. His figures are based on a recent Business Research Group survey of 500 businesses — partially paid for by Microsoft.

Jeff Dazell, LAN administrator for network services at Dana Corp. in Toledo, Ohio, said, "It cost us a lot more for our Windows NT Server upgrade, but it was well worth it. We're willing to pay more for NT because we get more functionality with the Back Office Server suite." □

Computerworld senior editors Patrick Dryden and April Jacobs contributed to this story.



Source: Computerworld Information Management Group, Framingham, Mass.

Fortune 100 tread carefully

Aberdeen Group, Inc. in Boston is readying a report on Windows NT 4.0 migration initiatives among 10 Fortune 100 businesses that turned up many tales of bloated costs and technical glitches.

Those flaws include the lack of a full-blown directory services database and management tools and a paucity of trained Windows NT network managers. The combination of those factors, the study concluded, at least doubled the cost of a migration from a legacy network operating system to Windows NT Server 4.0.

Author and analyst Bob Sakakeeny said he did a series of in-depth case studies with 10 clients encompassing NetWare and OS/2 Warp Server shops, some of which also had Windows NT installed as a departmental application server.

At least six of the businesses migrated or attempted to migrate to NT 4.0. Two others decided against an NT migration after performing internal price/performance studies, and the remaining two are still deciding. Although Windows NT Server 4.0 was particularly lauded as a departmental application and database server, it also has some significant price/performance flaws that are delaying its successful deployment as an enterprise operating system.

In several cases, Sakakeeny's on-site case studies revealed that at the high end, migration to Windows NT Server became so expensive and so bogged down with complexity that at least two of the companies decided to re-install upgraded versions of their original network operating systems.

Among the findings in Aberdeen's upcoming Onsite Migration Migraine report are the following:

- **A major international financial services firm with more than 5,000 desktops determined that it would rack up a 50% increase in management costs when it installed Windows NT Server on the enterprise. And it would have to spend $2 million to buy add-on management packages and third-party applications to compensate for Windows NT's limited scalability. It stayed with NetWare instead.**
- **A telecommunications company with 12,000 desktops and 400 servers that is in the midst of migrating from IBM's OS/2 Warp Server to Windows NT documented a one-third decrease in performance coupled with a 50% increase in management costs.**
- **Another firm migrating to NT from NetWare saw a sharp increase in network congestion, performance degradation and communications outages when it installed multiple NT Domains. One network administrator reported that a ping test message sent to trace network speed came back approximately 100 times slower than the same test on his prior Novell network. — Laura DiDio**

& **Novell hopes IntranetWare, clustering software will stave off NT defections. Page 57**

Microsoft pushes NT with deep discounts

▶ *Users warned to consider total cost of system upgrade*

By Laura DiDio

CHIEF INFORMATION OFFICERS WHO single-handedly decide on wholesale network operating system swaps, with no input from their IS managers or network administrators in the trenches, could be courting trouble.

A dozen businesses and analysts interviewed by *Computerworld* said Microsoft Corp. is particularly aggressive. It uses lures such as free Windows NT 4.0 licenses and discount technical support to get CIOs and upper-level nontechnical managers to convert to the NT operating system.

"To be successful, you have to be aggressive."

– Rich Tong, Microsoft

Bob Sakakeeny, an analyst at Aberdeen Group, Inc. in Boston, said he recommends that his clients ignore the sales pitch and inducements. "Windows NT 4.0 makes a great departmental application and database server. But it's just not ready to handle the entire enterprise, and I don't care if Microsoft elects to give it away for free," Sakakeeny said.

That is just about what the Redmond, Wash., software giant has been doing with certain large accounts, said Rich Tong, Microsoft's vice president of marketing in the Personal Business Systems Group.

"To be successful, you have to be aggressive. We will work really, really hard to get Windows NT installed. I tell big accounts, 'We really want your business. Tell us what it takes to do that,'" Tong said.

To wrest business away from Novell, Inc., IBM and other competitors, "Microsoft will match whatever discounts the other guy has. And sometimes we do give it away for free," Tong said. But migration costs go well beyond license expenses.

Such was the case for a Texas manufacturing company with 10,000 users. "Our CIO decided a year ago to migrate from [Novell's] NetWare to Windows NT after Microsoft promised free NT licenses. He went for the deal over the protests of MIS," said a network administrator at the company who requested anonymity.

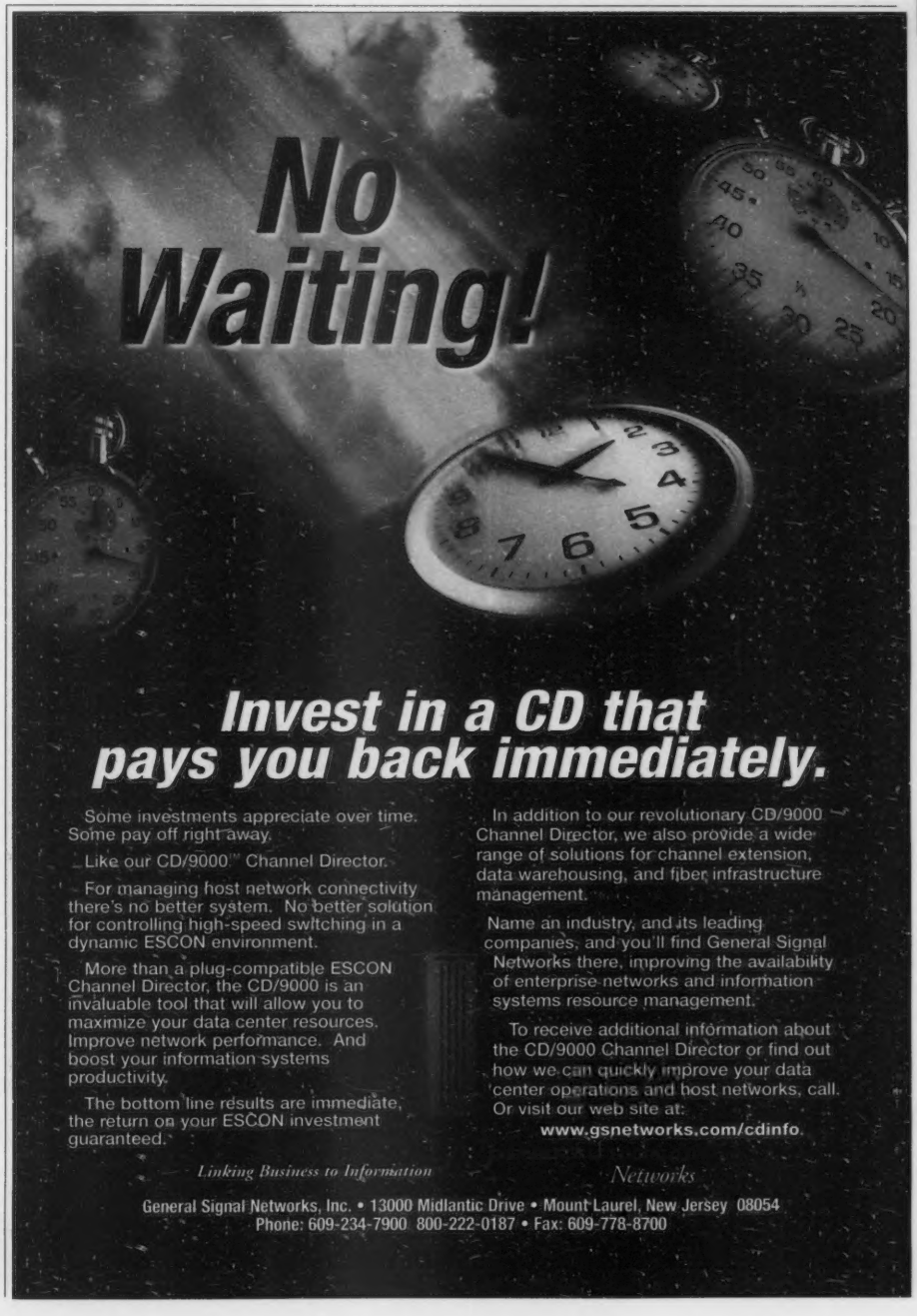
After the company's CEO realized that the CIO had spent more than $1 million — three and a half times the cost of an upgrade to IntranetWare — the CIO was fired, and the company switched back to IntranetWare 4.x.

Chris Bonanno, a network analyst at a division of an international pharmaceutical company with 12,000 users, said his firm avoided a similar fate because the CIO commissioned a cost study with heavy input from the information systems department.

"We were able to give him reasons [not to do a total NT] conversion: less functionality and higher maintenance costs. It would have cost an extra $500,000 and doubled our current roster of 15 network administrators," Bonanno said.

But the sales pitch works, as NT's burgeoning market share attests. Figures from International Data Corp. in Framingham, Mass., indicate that Microsoft's Windows NT Server this year will capture 20% of the network operating system market. In contrast, Novell's once overwhelming 75% market share has shrunk to about 55%.

"As far as we can determine, Windows NT Server is a loss leader for Microsoft," Sakakeeny said. "But Microsoft is building market share by discounting and hoping for a sell-through with SQL Server, Exchange, BackOffice and office automation products. And the strategy is working." □



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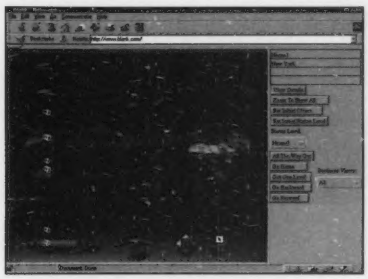

Unicenter TNG uses virtual reality to create a 3-D environment representing objects in the real world.

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	# Of Developers	Develop Time (mos.)	Person Mos.	With TNG Framework
2-D and 3-D User Interface	5	8	40	Available Now
Object Repository	8	12	96	Available Now
Auto Discovery	6	9	54	Available Now
Calendar Management	5	8	40	Available Now
Virus Detection	3	7	21	Available Now
Reporting	4	5	20	Available Now
Business Process Views	6	7	42	Available Now
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ValiCert makes offer to track digital deadbeats

▸ *Certificate revocation system requires buy-in from electronic-commerce community*

By Sharon Machlis

A CRYPTOGRAPHY START-UP says it's got the solution for what is likely to become a sticky problem in managing digital certificates: how to handle certificates that go bad.

Much like with credit cards in the physical world, issuers and users of digital certificates must ensure that those certificates — used to confirm payments or authorize transactions — are actually valid.

If a certificate is lost (such as when a laptop is stolen) or revoked (if its owner doesn't pay the bill), the issuing authority must somehow notify vendors throughout cyberspace.

The emerging electronic-commerce structure would rely on certificate revocation lists (CRL), files similar to lists of bad credit cards. But the founders of ValiCert, Inc. said as electronic commerce becomes more popular and the number of digital certificates mushrooms, the CRLs will become too large and unwieldy for quick real-time transactions.

ValiCert's answer involves collecting CRLs from various certificate issuers and using an algorithm to create certificate revocation "trees." By tagging each certificate on the list to various levels of information above it, the amount of data is streamlined by pointing to the location on the tree instead of incorporating the full data.

ValiCert has "definitely made the right partnerships. Whether it works or not remains to be seen."

– Marlo Kosanovich, Meta Group

Cryptography expert Martin Hellman is on the company's advisory board and said ValiCert's technology addresses an important roadblock to certificate validation.

But for the ValiCert technique to work, it must be incorporated in various electronic-commerce applications, all major certificate issuing authorities must adopt it, and electronic-commerce vendors must choose to turn to ValiCert for checking on certificates.

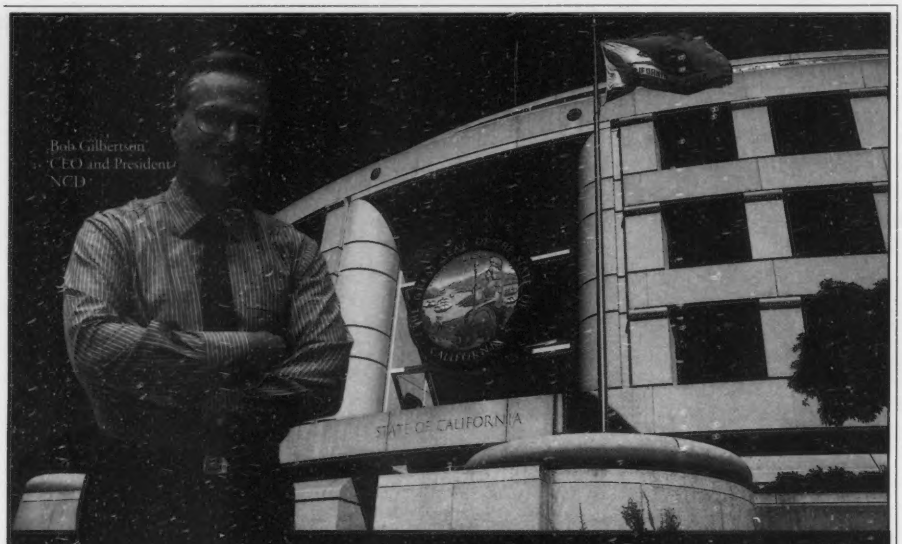
"They've definitely made the right partnerships," said Marlo Kosanovich, a senior research analyst at Meta Group, Inc. in Stamford, Conn. "Whether it works or not remains to be seen." It depends on whether the company's tool kit is used to implement real-world applications for the concept, she added.

INDUSTRY SUPPORT

Several major players support the concept, including Entrust Technologies Ltd. in Richardson, Texas, and GTE CyberTrust in Needham, Mass.

The ValiCert tool kit is available free for noncommercial use and evaluation at *www.valicert.com*. Application development licenses cost $995 per year. A ValiCert server will be licensed to certificate issuing authorities.

Kosanovich predicted it will be late 1998 before the use of digital certificates begins to take off. "They're off to what seems to be a promising start," she said of ValiCert. Now the company has to wait as the market catches up, she added. □



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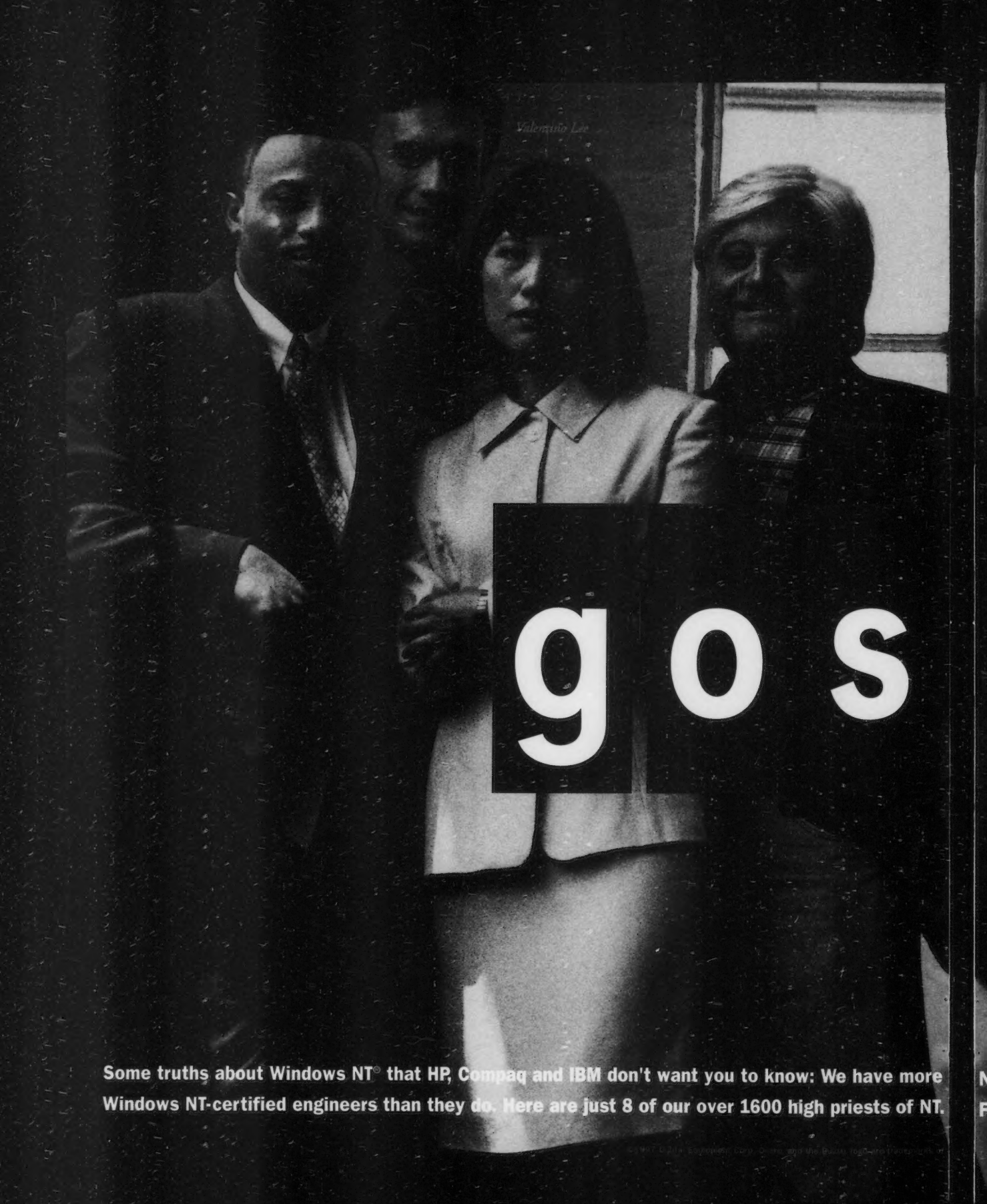

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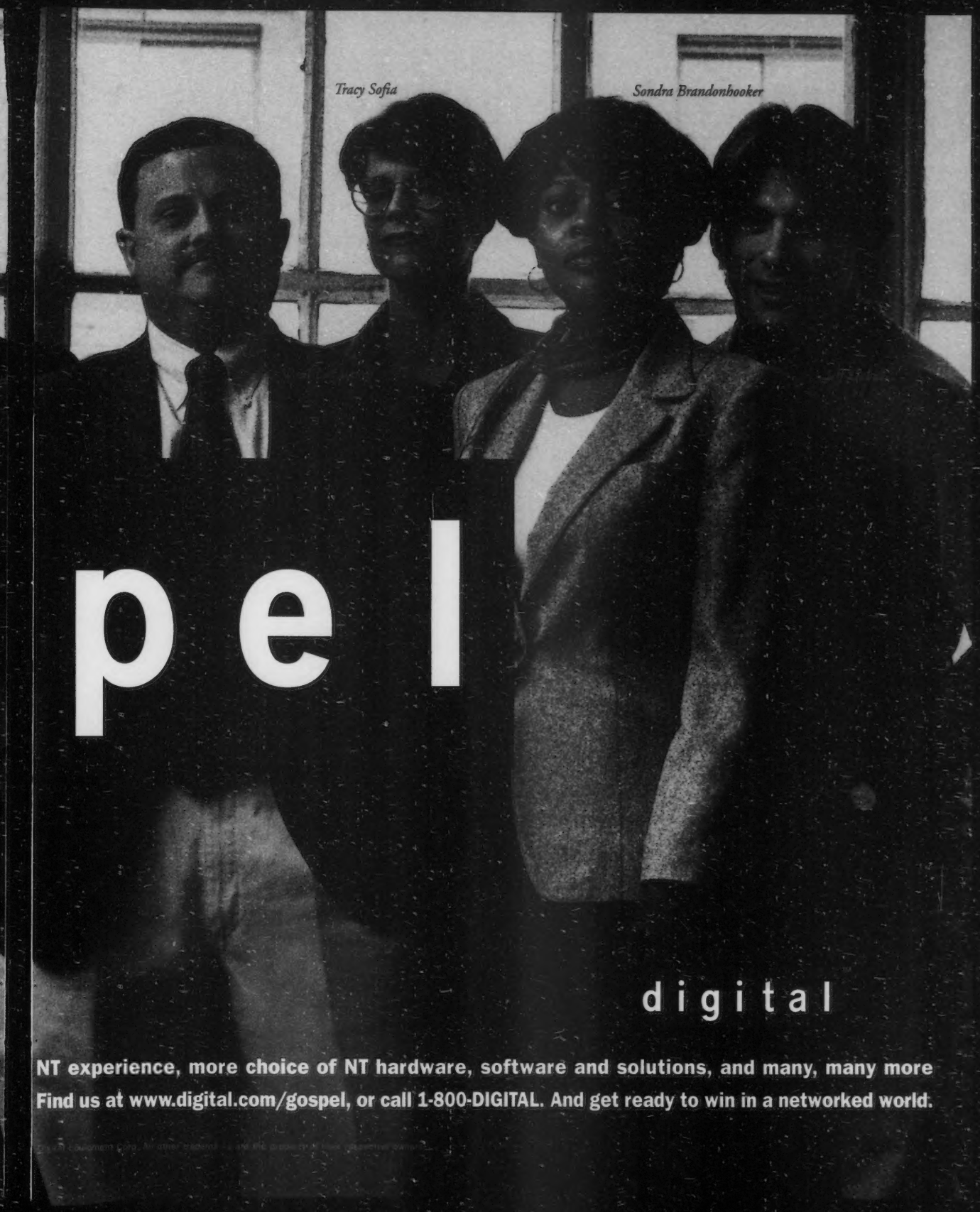
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StorageTek tapes go virtual

By Tim Ouellette

THE LEADING high-end tape systems vendor is trying to get customers to use fewer tapes.

At its annual user conference last week in San Francisco, Storage Technology Corp. announced a disk/tape/software bundle that will let users more efficiently load data into their StorageTek tape libraries, allowing them to save valuable floor space.

Virtual Storage Manager (VSM), due early next year, uses a disk array to cache data until there is enough to fill a tape cartridge. It can store the most-used tape data in memory for fast access.

"With VSM, we will be able to share more resources found in the data center and reduce the overall cost per megabyte of storage," said Vincent Turco, supervisor of data center services at Nissan North America, Inc. in Englewood, Colo.

Michael McLean, manager of enterprise storage at Harris Methodist Health, Inc. in Arlington, Texas, said VSM will free up room to let the company's largest applications grow without hindrance.

Although it looks as if StorageTek might be cannibalizing its own tape sales to sell VSM, company officials said they are giving users a better way to use the tapes they already have and are helping users fully automate their tape systems.

Most data centers still have many tapes sitting on racks instead of in StorageTek's robotic tape libraries, where users can electronically access the data.

"With VSM, we will be able to share more resources found in the data center and reduce the overall cost per megabyte of storage."

– Vincent Turco, Nissan North America

"This will be important for anyone required to keep data around for a long time and those who need really quick response time," said John McArthur, an analyst at International Data Corp. in Framingham, Mass.

Louisville, Colo.-based StorageTek isn't the first out of the gate. IBM and Sutmyn Storage Corp. in Santa Clara, Calif., are already shipping virtual tape products.

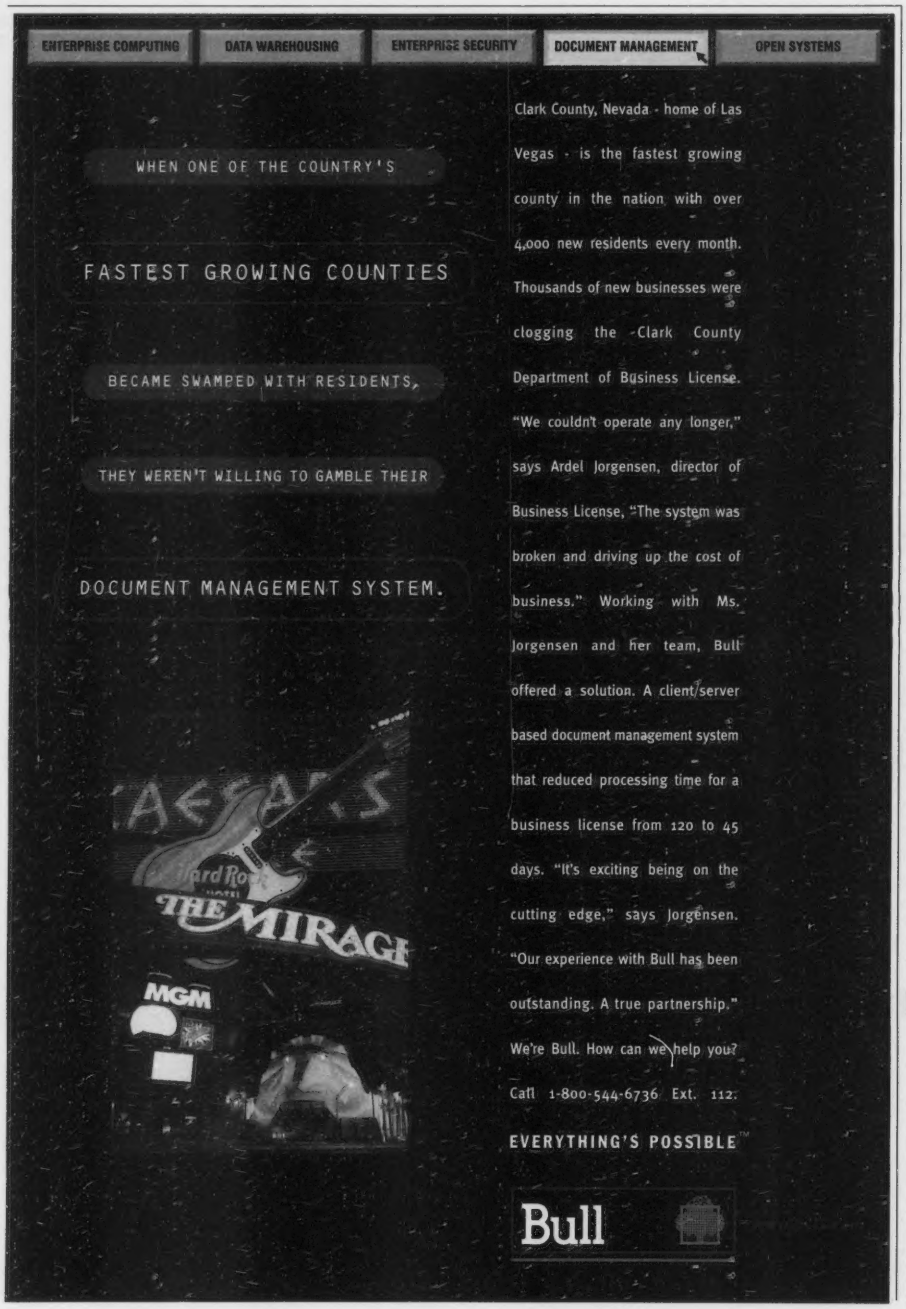
But StorageTek officials said VSM makes up in performance what it loses in timing. It includes StorageTek's own high-speed disk array — the Ramac Virtual Array — 14 host paths and 930G bytes of disk caching.

Though a 1996 agreement made IBM the only seller of StorageTek's powerful Ramac Virtual Array, IBM isn't allowed to use it in its own Virtual Tape Server (VTS). Instead, IBM uses its 7133 SSA disk array.

IBM is using its time wisely, though. Earlier this month it doubled VTS's disk cache to 144G bytes and added an improved Magstar tape controller. □

VIRTUAL TAPE A REALITY

	StorageTek Virtual Storage Manager
Disk array	STK Ramac Virtual Array
Accepted tape drive	STK Timberline or Redwood
Cache	180G to 930G bytes
Data channels	8 to 16
Availability	Q1 1998
Price	$300,000 to $2M



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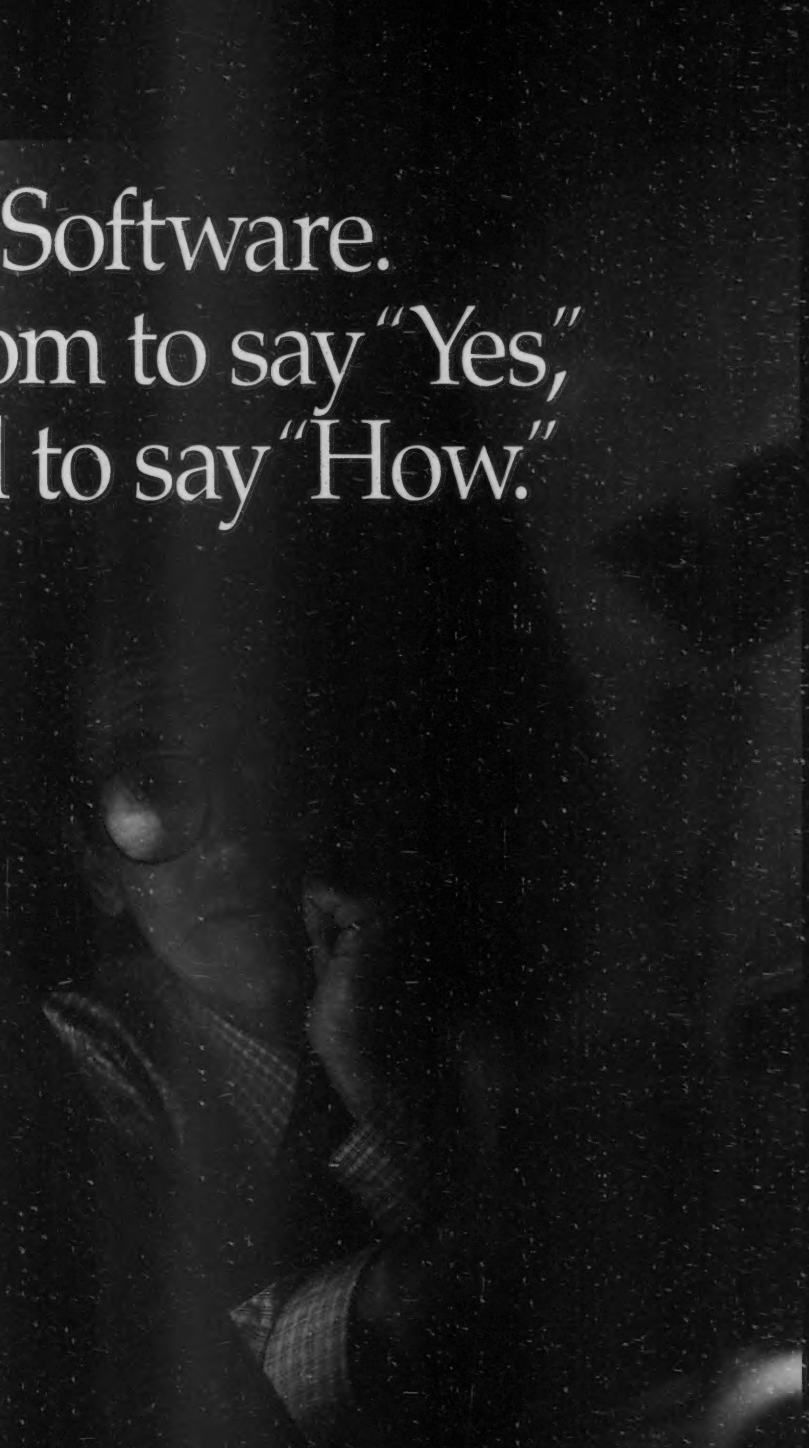

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Risk-takers play venture capital game

CONTINUED FROM COVER 1

Motorola, Inc. in Schaumburg, Ill.; and United Health Care, Inc. in Minnetonka, Minn.

Critics say IS departments that play venture capitalist could get in over their heads and waste large sums of money in a field best left to professionals.

But successful ventures can help convince boardroom skeptics that IS shops can act "more like a profit center instead of as a subservient cost center," said Jerry Luftman, professor of management at Stevens Institute of Technology in Hoboken, N.J.

IS executives "do not act and think as businesspeople as much as they think they do," said Vaughan Merlyn, vice president at The Concours Group, a Roswell, Ga.-based consultancy. A venture capital unit can provide IS a better understanding of the business side of high-tech, "especially as IS shops rely more and more on technology vendors," Merlyn said.

At GE Capital, the investment of an undisclosed amount of cash in PointCast provided the IS shop with early access to PointCast's push technology, which GE incorporated into some of its 11 extranets.

McKinley said GE Capital has "gotten some very good early performance" out of its PointCast investment, leading to further investments in companies such as I2 Technologies, Inc., a supply-chain software vendor in Irving, Texas, and Streamline, Inc., an online shopping service in Westwood, Mass.

How do IS departments get access to this pool of mad money? The IS group at Blue Cross/Blue Shield of Massachusetts secured a seven-figure pool of venture capital in 1995 by persuading the board of directors to invest the same amount of money on external software developers as it spends on internal software development.

The company's push into managed care was being stymied by the lack of off-the-shelf software (see story below left).

Investments in innovative start-ups often yield a glimpse into new ways of doing things. BT Ventures in 1995 invested in New York-based Zoologic, then an 18-month-old developer of multimedia training software, which uses pictures, numbers and words to teach users how to understand the meaning of complex financial instruments. BT Ventures' parent company, Bankers Trust, has since used the software internally to train hundreds of employees, said John Herron, Jr., senior managing director of BT Ventures.

CLOSE TO HOME

A more common approach is for IS to tap the resources of a venture capital unit elsewhere in the company. That tactic has worked very well for Motorola's internal IS unit.

In 1991, it quietly plunked down a 20% stake in a small, 5-year-old maker of frame-relay switches. The result: Motorola gained access to Stratacom, Inc.'s equipment three years before the frame-relay market took off.

In addition to the financial returns the investment generated after Stratacom went public in July 1992 (and before Stratacom was acquired in April 1996 by Cisco Systems, Inc.), Motorola used the switches to build a global frame-relay network and slashed its voice and data costs by 20%.

J. P. Morgan's Mike Reilly:

His IS group used firewall software from a venture firm, a year ahead schedule

The frame-relay investment has saved the company "tens of millions of dollars" annually, said Les Schroyer, former chief information officer at Motorola and now general manager of Motorola's Internet software products division.

By partnering with its in-house venture capital group, Motorola's IS division can use its "IT infrastructure as a test bed" and "shake down those products before they get to market," Schroyer said.

But is the venture capital game the best way for IS to get a sneak peek at new technologies?

Ephraim McLean, an expert on IS strategy at Georgia State University in Atlanta, said a better use of limited resources is to invest in a small in-house "advanced technology group" that can experiment with a wide variety of emerging technologies. That sort of investment can be more flexible and "a lot cheaper than trying to sprinkle money on flaky start-ups," McLean said.

J. P. Morgan's John Forlines

"It's extremely valuable for an underwriter to have" in-house technology resources"

Besides, IS departments aren't usually known for their financial savvy, said Andrew B. Whinston, professor of computer science and economics at the University of Texas at Austin.

An IS department — unskilled in distinguishing good investments from overly risky ones — could get "snookered" by a start-up with a glitzy prototype, he said.

But that problem may not apply to IS departments that collaborate with savvy venture capital outfits within their companies.

For example, the IS department can identify hot technology companies for the venture capital unit to fund and then get early access to the technology.

That's what happened at J. P. Morgan last year when the bank's IS group came across Trusted Information Systems, Inc., a Glenwood, Md.-based maker of Internet firewall and security software.

"Our technology people were able to [identify] a company with high-end technology that would be attractive to Fortune 100 companies," said John Forlines, a managing director who helps find investment clients for J. P. Morgan Capital. "It's extremely valuable for an underwriter to have that resource," said Forlines, whose group took Trusted Information Systems public last year. In return, J. P. Morgan's IS group was able to use the firewall software internally to provide its investment banking customers access to the firm's internal data about a year ahead of original plans, said Mike Reilly, a vice president in the bank's IS group.

At Fidelity Investments, the venture capital arm invested in Devonshire Technology, Inc., a Seattle-based developer of stock portfolio management software, mostly for the financial rewards. But a side benefit of the deal was that it gives Fidelity a way to develop investment software for in-house use, "using a small-company approach," said Stephen Campbell, president and CEO of Devonshire.

CLOSE TO THE VEST

IS executives involved in the world of venture capital are often reluctant to talk about the financial details on grounds that the deals can provide a competitive advantage and, potentially, a big payoff.

GE Capital, for example, has invested in Auto-By-Tel in Irvine, Calif., an Internet-based auto shopping network. In turn, prospective buyers can apply online for financing with GE Capital.

So far, GE Capital has gotten "some very good early performance" from its Auto-By-Tel investment. How good? "I'd have to kill you if I told you," McKinley quipped. □

Assistant news editor Mitch Betts contributed to this article.

Companies with IS departments involved in venture capital

Company	Funds invested	Sample recipient
United Health Care	$40 million	Dow Systems (San Diego)
GE Capital	Not disclosed	I2 Technologies (Irving, Texas)
Fidelity Investments	$75 million	Geotel Communications (Littleton, Mass.)
J. P. Morgan	$1 billion	Trusted Information Systems (Glenwood, Md.)

Health care venture flatlines

It isn't so surprising that IS departments in the financial services industry would get involved in high-tech venture capital. But health care?

Yes, health care. Blue Cross/Blue Shield of Massachusetts, for example, used its venture capital unit to become one of the first of the so-called "Blues" to offer some services via the Internet in 1995.

Yet although company officials deemed the unit a financial success, Blue Cross has decided to shut down its New Health Ventures division at the end of this year. Officials cited two reasons for the closure: When New Health Ventures' president Russell Ricci left to join IBM late last year, most of his four-person staff left with him. And then Blue Cross reported a $90 million loss for 1996, forcing it to refocus on improving the company's core operations, said a spokeswoman for the Boston-based health insurer.

New Health Ventures was formed in 1995 to team up with other venture capitalists and invest in IT vendors. Blue Cross acted as an alpha site to test their technologies. Ricci said Blue Cross took the investment approach because "there were no off-the-shelf applications available to solve our business problems," such as streamlining operations for the cost-conscious managed care revolution. Ricci is currently general manager of IBM's global health care industry practice in Waltham, Mass.

New Health Ventures would place "bets in the six- to seven-figure range" on technology vendors, Ricci said. Then the other venture capitalists would match that figure tenfold to twentyfold, Ricci said. "We were basically using other people's money to solve our business problems," he said. Ricci said Blue Cross' seven-figure start-up investment in New Health Ventures was "more than covered" by its investment returns.

Through one of New Health Ventures' investments, Blue Cross was able to gain early access to an automated enrollment system that it used to link 1,700 employer customers for electronic enrollment in 1995. The system helped Blue Cross eliminate paper enrollment, decrease phone calls to its call center and improve overall customer satisfaction, Ricci said.

— Thomas Hoffman

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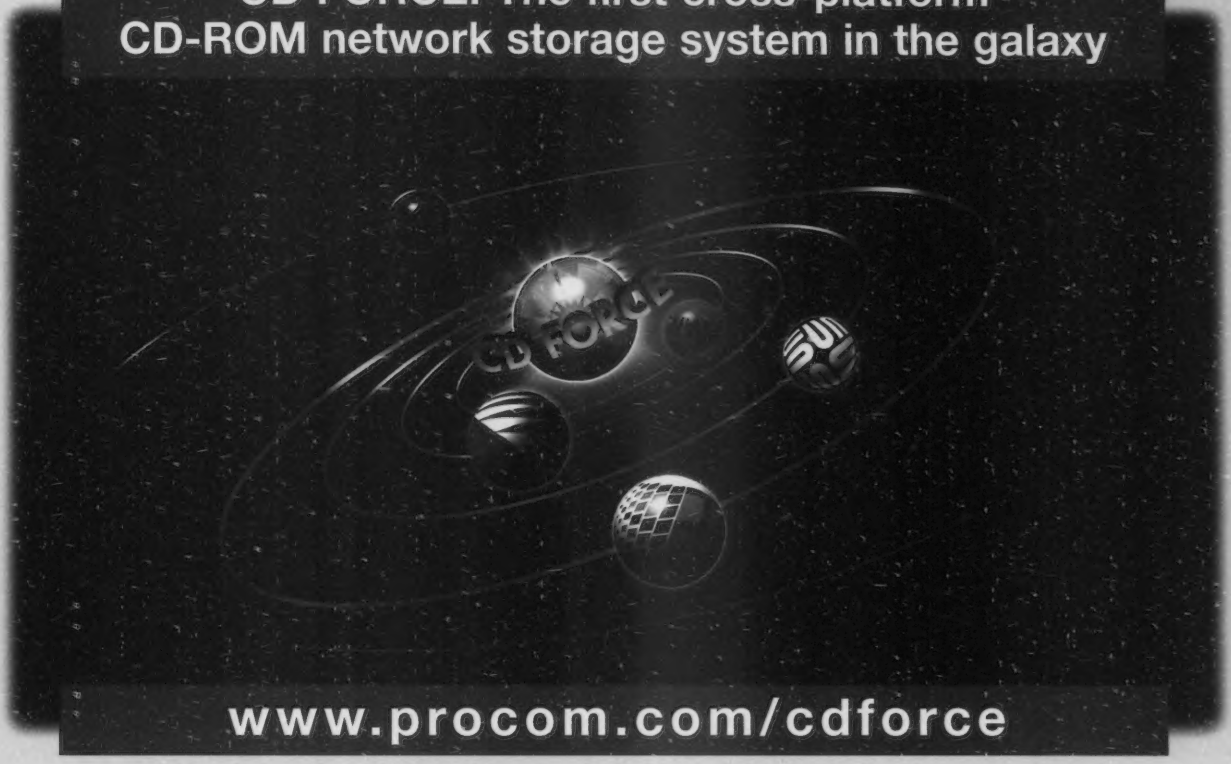

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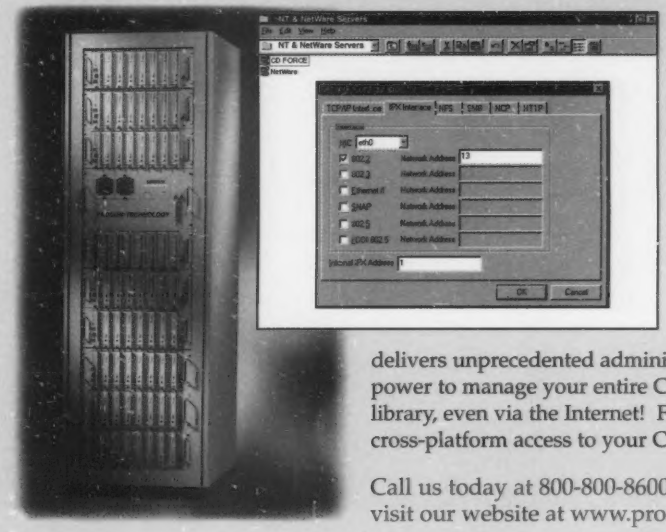

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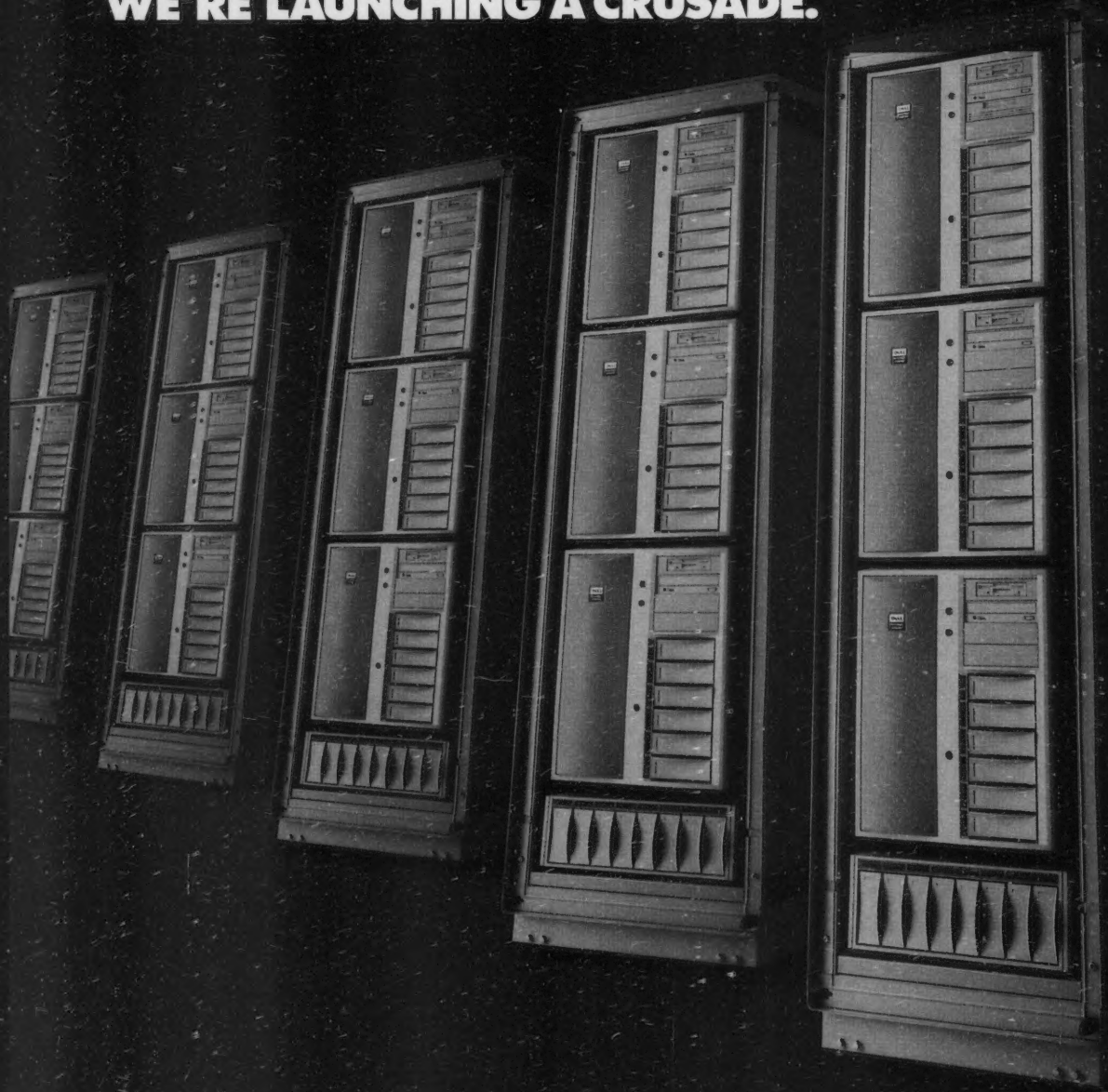

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Computer Industry

Briefs

Apple woes deepen

The financial slide continues at Apple Computer, Inc. The company reported a quarterly loss of $161 million on sales of $1.6 billion. Apple said the bad financial news will trigger another round of layoffs.

Unisys comeback

Unisys Corp. in Blue Bell, Pa., is headed for its first profitable year since 1993. The company reported third-quarter net income of $50.9 million, up from $14.2 million last year.

NCR to slash jobs

NCR Corp. in Dayton, Ohio, posted a third-quarter loss of $9 million and said revenue fell 6% from $1.66 billion to $1.56 billion. The company expects to make job cuts next year.

Lucent buys Livingston

Lucent Technologies, Inc. in Murray Hill, N.J., last week said it will acquire remote access device maker Livingston Enterprises, Inc. for approximately $650 million worth of Lucent stock.

Intel growth flattens

Intel Corp.'s third-quarter revenue rose 20% to $6.2 billion from $5.1 billion in its third quarter last year. The company warned that fourth-quarter revenue will be only slightly higher. Intel earned $1.57 billion, up from $1.31 billion.

Compaq rolls on

Compaq Computer Corp. reported a 42% jump in third-quarter income, from $365 million to $517 million. Revenue rose 31%, from $4.95 billion to $6.47 billion.

Digital posts profit

Digital Equipment Corp. in Maynard, Mass., had profits of $25 million on revenue of $2.96 billion for its quarter ended Sept. 27. This compares with a loss of $66 million on revenue of $2.91 billion in the same period last year.

The company attributed its gains to growth in server sales, while service revenue was flat.

McAfee, Network General will merge

▸ *Companies combine tools to tackle NT troubles, users hope support continues*

By Patrick Dryden

SEEKING TO CASH IN on the rapid spread of Windows NT into corporate client/server networks, McAfee Associates, Inc. and Network General Corp. last week announced they will merge.

The combined company, Network Associates, Inc., plans to create an integrated suite of products supported by a single sales and support organization.

The goal is to help information systems managers overcome problems supporting PCs, servers and networks based on the Microsoft Corp. software.

SUITE APPROACH

The company plans to create four business units focused on virus defense, network visibility, network security and service desk. A suite called NetTools will run on Windows NT to manage networked PCs and reach out to Unix systems, as well.

"Sounds like that covers all your bases," said Diane DelVecchio, a systems engineer at integrator Network Data Services, Inc. in Plano, Texas.

Network Associates should do well with its complementary product mix and targeting of Windows NT. "The suite approach is very attractive, and Windows NT is the market sweet spot," said Greg Cline, an analyst at Business Research Group in Newton, Mass.

ANATOMY OF A MERGER

McAfee Associates Santa Clara, Calif.	Network General Menlo Park, Calif.
(Virus scanner, desktop/server management tools, help desk)	(Protocol analyzer, network security, network performance)

McAfee offers stock valued at $1.3 billion

Network Associates, Inc.

- 10th largest independent software company based on combined 1997 revenue of $600 million
- Focus on Windows NT client/server networks
- Common sales, support and field service
- Integrated suite for managing network, security, viruses and help desk

Cline cautioned that integrating the diverse management tools probably will take six to 12 months.

McAfee, in Santa Clara, Calif., is a leading supplier of virus detection software, LAN and desktop management tools, help desk software based on Windows NT and PC encryption software.

Network General, in Menlo Park, Calif., is the leading vendor of protocol analyzers. Its Sniffer line of hardware/software tools captures packets flowing across networks to help troubleshooters and software developers diagnose communications problems.

Network General recently launched software for monitoring performance, service levels and security violations in networks.

Merger talks began over lunch a month ago, said Les Denend, president and CEO of Network General. Denend will become president of Network Associates. Bill Larson, McAfee's president, CEO and chairman, will be chairman and CEO of the new company.

USER CONCERN

Some users expressed concern about the merger.

"I hope to see these products work together better," said Jim Robertson, a network operations supervisor who uses three McAfee tools and Network General's distributed Sniffer to support an 11,000-user network at Georgetown University and Medical Center in Washington.

Robertson added that he hopes Network Associates won't forget about Novell, Inc.'s NetWare, which runs 95% of the servers on campus. "There definitely will be a problem if they don't equally support NetWare with the integrated suite," he said.

Another potential problem is the "dilution of Network General's technical focus," said Steve Tindall, a senior technical specialist at Allegiance Healthcare Corp. in McGaw, Ill. "I hope they don't lose their expertise in detailed network analysis when they try to address the needs of the masses," he said. □

Wright named Amdahl CEO; will push services, consulting

By Tim Ouellette

AMDAHL CORP. got a new owner last month. Now the Sunnyvale, Calif., firm has a new CEO.

David B. Wright, previously executive vice president of Amdahl's hardware and systems support, last week succeeded John Lewis as president and CEO. Lewis will remain chairman of the board.

The move follows on the heels of Amdahl's purchase last month by Japanese computing giant Fujitsu Ltd. for $850 million. Wright's background in services will be crucial in Amdahl's move from a hardware-dependent company to one that expects to garner more than half of its revenue from software, services and consulting.

LOOKING INWARD

Wright told *Computerworld* that Amdahl never looked outside its ranks for Lewis' successor. Lewis had planned to step down as CEO after helping to improve Amdahl's long-term strategy during the past few years, he said.

"Jack is a tremendous teacher," Wright said. "And now we are going to a different level in our business, and we will be doing different things."

That strategy is to help give Fujitsu more market share outside of Japan by targeting the largest information technology buyers and delivering them a range of products — from mainframes to consulting to maintenance and service.

That also will help Amdahl compete on a more level footing with longtime mainframe rival IBM.

"We want market share of the IT budget, not just MIPS shipped or storage devices installed," Wright said. "We want to bring more to the table than just a product play." □

"We want market share of the IT budget, not just MIPS shipped or storage devices installed. We want to bring more to the table than just a product play."

– David B. Wright, president and CEO, Amdahl Corp.

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23. Dir./Mgr. Sys. Development, System Architecture
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13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
51. Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
80. Information Centers/Libraries, Educators, Journalists, Students
90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply.)

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(a) Solaris (e) Mac OS
(b) NetWare (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTStep

App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No
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65. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/Refining/Agriculture
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Dist./Retailer
95. Other_____ (Please Specify)

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23. Dir./Mgr. Sys. Development, System Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Management
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(b) NetWare (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTStep

App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No
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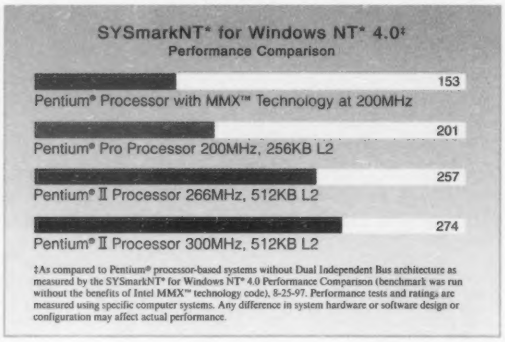

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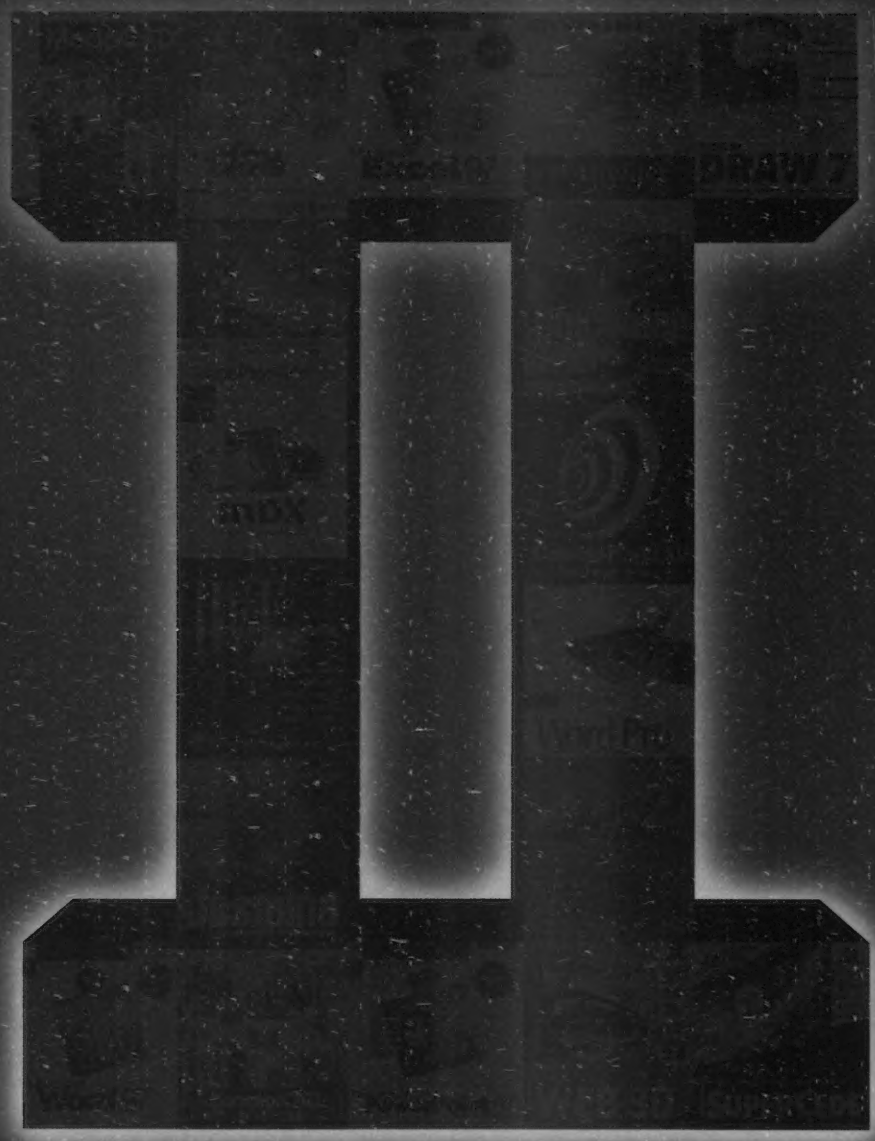


OPINION

Silicon shame In about the time it takes you to read this sentence, somebody out there will turn 50. If that somebody happens to be a highly skilled, experienced systems analyst, Cobol programmer or application designer, would your company hire him?

Not if you're reading this in Silicon Valley, apparently. Age discrimination seems to be a nasty fact of life among many of the high-tech enterprises that dot this stretch of California. That's the hard-earned conclusion Gordon Clark came to after the 62-year-old part-time consultant watched hundreds of his resumes ignored up and down the Valley.

"It became very apparent that I was something to go away and sit on the shelf," he told *Computerworld* reporter Julia King (see story in the Oct. 13 Corporate Strategies section). Clark has more than 20 years of project management work under his belt, plus another 10 years as CEO of his own software company.

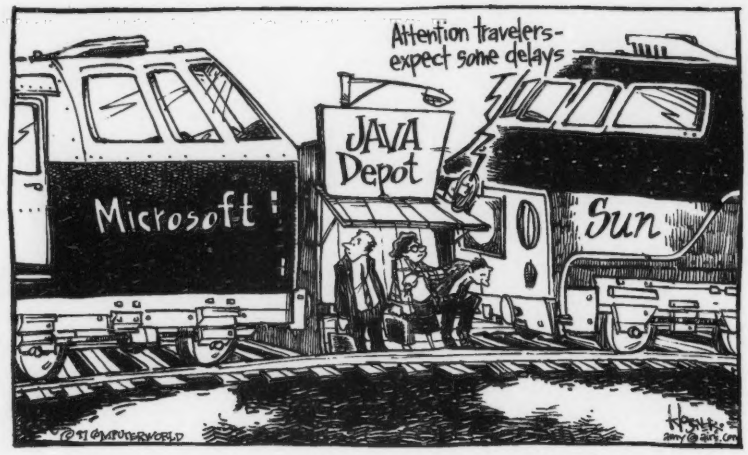
This former chief exec is one of the 7,000 IT professionals registered at Senior Staff 2000, a database of retired and over-50 experts in Cobol and other mainframe skills. Exactly the kind of skills that IT shops nationwide are scrambling to procure as the countdown continues to the year 2000.

Maybe high-tech centers such as Silicon Valley are immune to the century date-change disasters. They'd better be, because twentysomething Web designers and Java jockeys aren't going to be interested in working on year 2000 projects. Ironically, the more experienced workforce often is looking for a part-time consulting gig rather than full-time work — meaning no overhead for health insurance.

Now that Uncle Sam has deemed the IT labor shortage a national emergency, even the real world beyond the computer industry is taking notice. It'll be interesting to see what happens to this Silicon shame as the more youthful end of the talent pool drains away. Revenge of the senior nerds, perhaps?

Maryfran Johnson

Maryfran Johnson, *Executive editor*
Internet: *Maryfran_Johnson@cw.com*



LETTERS

Most Internet E-mail fails Communications 101

As an organization that has been providing E-mail access for more than a year to outside users, I was pleased to find out how well our agency does in responding to E-mail ["Consumers www.wait for E-mail responses," CW, Sept. 15].

I get extremely tired of reading about how bad the bureaucracy is, and I think our response time is far superior to what you experienced. You might try going to our agency's World Wide Web site (*www.window.state.tx.us*) and trying us out. Thanks for the information on how other organizations handle E-mail. Our folks will be pleased.

Stuart Greenfield, analyst
Comptroller of public accounts
Austin, Texas
stuart.greenfield@cpa.state.tx.us

I started keeping a log and journal of online messages I sent to various companies requesting support. All were legitimate matters. Most have yet to reply — after months! A few replied after I sent another message clearly labeled "Second notice." A couple of firms replied only after I threatened to return the merchandise or cancel an order.

For another article, how about looking into the many Web pages that waste your time with forms that require you to enter a lot of data in blanks, and then when you submit it, you get an error message. Or those sites that have so many graphics changing on the page that you can't tell if it's finished loading.

There seem to be many companies that are ambitious about their Web sites, but they are hiring techie gurus to design the pages. They insist on all the latest goodies yet ignore the main reason the page exists: customers! Thanks for a great article. A wake-up call is sorely needed.

Gordon Hesketh
MIS manager
LaPorte, Texas

Your article about Web site E-mail problems in the Sept. 15 issue identified a definite business communication failure, but you failed to note that the biggest and most inexcusable violator is the computer industry. Wouldn't you think that companies selling hardware and software that is intended to help people communicate would recognize the importance of communicating with their customers and potential customers?

> Companies insist on all the latest goodies yet ignore the main reason the page exists: customers!

Sure, E-mail can be overwhelming if you aren't prepared for it. The same is true of telephone calls.

But if a company is willing to spend millions of dollars for blanket advertising in the hope that perhaps 1% (or fewer) of the people seeing the ad will be interested, why won't they commit a few bucks to talking with those people when they call or drop a message in the E-mail box?

Stupid.

Charles A. McNulty
Queensbury, N.Y.
mcnulty.group@palmtop.com

Your recent article about companies that put up Web sites for reasons other than profits struck a chord with me. I was recently in the market for a new dishwasher and decided to check the Web.

There were two companies of interest to me: Maytag and another popular manufacturer.

When I visited the Maytag site, I found complete specifications that could be downloaded as PDF documents, which clearly explained all the features and dimensions of each model.

When I visited the competitor, I found one of those cute little construction worker icons with a message to check back later when the site was complete.

I assume you can guess which dishwasher I bought.

Paul Lourd
Director of technology
UST, Inc.
Greenwich, Conn.

More letters, page 39

Computerworld welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Maryfran Johnson, Executive Editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

Who's in charge here?

Michael Cohn

There was a time when CIOs were cool. When IS middle managers were in demand. A time when even CFOs and CEOs actually called the shots. Not anymore. Executives are out. Power users (most of them, anyway) are out. If you've got expensive wood furniture in your office, take a hike.

You're not in charge anymore. We are. The meek. The humble. The lowly bottom rungs of IS.

With so much to do and so few of us to do it, we call the shots now. To all you power-tie-wearing, cigar-smoking, expensive-Japanese-sedan-driving folks out there: Make room. Move over. Update your resumes. Things are going to be different.

Because from now on, these people are in charge:

THE PEONS

High-tech cubicle dwellers are in charge. You tried to downsize us. Demote us. Defeat us. You threw us $26,500 plus two weeks' vacation.

Executives are out. With lots to do and few of us to do it, those at the bottom rungs of IS call the shots.

But now the workload is huge. The projects have piled up. The payroll is thin. So we set the schedules. No more death marches. No more working weekends. No more on-call.

You want us to wear beepers? Okay, but only so headhunters can always get through.

THE RECRUITS

With a skills shortage, even new hires are in charge. Remember the days when nervous college seniors interviewed in suits that still had a tag or two on the sleeve? Forget it. You're lucky if they come in wearing an Izod. You're lucky if they come at all. One-hour interviews now take one minute. "Yeah, I heard of Visual Basic. OO? I can spell it. And we had some of those Pentium computer things at school. So what salary are we talking, 70-plus? More important, is there a Starbucks around here, or what?"

THE CONTRACT PROGRAMMERS

Heavens, no! But it's true. Everyone's looking for contractors. So these programmers are in charge, too. Everyone's got consultants in the budget. You know Sybase? The RPG language? English? Come on in and sit down. How does $85 an hour sound? And if it's not too much trouble, it would be nice if you worked at least three hours per day, preferably here in the office. But you can dial in from home if you promise to lower the volume on the soaps.

THE VENDORS

This is truly disgusting, but *vendors* are also calling the shots. Their phones are ringing off the hook. People want software. People want services. Overworked vendors smugly send them to the back of the line.

Slimy salespeople are handpicking their prospects. Thirty-day sales cycles? They're 29 days too long.

Discounts? Don't even think about the D-word. These days, list price is a discount — because vendors will probably be raising prices every week through 2000.

THE END USERS

Finally, a few of those pesky end users are still in charge.

Contrary to popular belief, we can't tell them all to jump in the lake. Vendors can no longer make them pay for lunch. The help desk can no longer stick them on hold for weeks at a time.

Because even with all this inflated pricing, pitiful service, personnel shortage and contention for labor, we need to stay close to our end users — because a few of them are taking Cobol classes at night, and we could sure use the help. □

Cohn is a computer consultant in Atlanta.

Lax data policies pollute intranet pond

Michael Schrage

Got an E-mail epigram that made me smile: "We have all heard that a million monkeys with a million typewriters would eventually reproduce the entire works of Shakespeare. Now, thanks to the Internet, we know this is not true."

By the time I'd finished smiling, I had mentally outlined this column. Although I'm an enormous fan of the 'net and an honest believer that intranets will have a bigger impact on the quality of work than, say, total quality management, I get this queasy feeling whenever I browse. I see "facts" that aren't and "data" of questionable parentage. Was it Will Rogers or Mark Twain who wrote, "It's not what you don't know that hurts you — it's what you do know that ain't so"? I'll check that out on the 'net. . . .

Net issues such as data integrity and the lack thereof have gotten great mainstream media play, thanks to newbies such as Pierre Salinger and his TWA Flight 800 conspiracy theories. Unfortunately, comparable energy hasn't been focused on the data integrity of intranets. Every day, it becomes easier for a department or salesperson — or a key supplier or valued client — to link their site (read: data) to the enterprise intranet.

More often than not — that is, 94.99% of the time — no formal data quality/data integrity standards are required of the linkers. That scares me.

To be sure, data integrity has always been a critical component of IS management. What's the point of having superb digital technologies chock-full of crappy information? At least in the relatively centralized glass-house era, it was unambiguously clear that IS had direct responsibility and influence over the information its mainframes were munching — the good old days of "garbage in, garbage out."

Of course, data integrity issues were hot-button topics during the initial waves of client/server computing. But the irresistible rise of netcentric computing has really placed IS in the most awkward high-risk/high-exposure predicament. To wit, when Big Company gets caught dumping toxic waste in the water supply, it gets fined, penalized and scorned by the community. Of course, if Big Company is also the town's biggest employer and taxpayer, that complicates matters.

Regardless, the water utility is still expected to detect the pollution and purify the troubled waters.

Alas, the analogy holds for the netcentric enterprise: Big Department pollutes the intranet with outdated or not-quite-right data, which leads to unfortunate misunderstandings with important customers. All of a sudden, it's "Why isn't IS enforcing guidelines for data integrity? After all, they're running the network, right?"

What's the point of superb digital technologies full of crappy information?

The last thing a CIO and an IT department need to become is a censor cum intranetwork nanny for the enterprise. Getting caught up in the politics of information distribution can be brutal.

On the other hand, insisting that departments and individuals publicly warrant that the data on their sites is valid and forcing people to post "expiration dates" on pages are excellent first steps toward creating a net culture free of Shakespeare-emulating primates.

There's nothing wrong in principle or practice for IS to politely but firmly insist that people not pollute their networks.

An outdated invoice can do more damage to a company than a virus.

As we move from info-intranets to electronic-commerce transactions across the Web, managing data integrity will become the biggest price we pay for netcentric computing. □

Schrage is a research associate at the MIT Media Lab and author of No More Teams! *His Internet address is schrage@media.mit.edu.*

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LETTERS

Lucent tackles 56K standard

THIS LETTER IS IN RESPONSE to a brief ["56K standard delayed"] that appeared in *Computerworld*'s Sept. 22 issue about the status of standards regarding 56K bit/sec. modems. It states that the International Telecommunications Union (ITU) has delayed a vote on a standard until January because ITU members "apparently want the two companies with the modems to share some of their patented technology."

The item identified 3Com and Rockwell as the two firms. The only company that has advised the ITU of any specific patents it believes may be applicable to a forthcoming standard is Lucent Technologies. The three issued patents Lucent holds are the result of what we believe is the earliest work in this technology.

3Com has indicated that it would license all patents it owns relating to the anticipated standard, without identifying any such patents. To the best of our knowledge, Rockwell has not identified any patents applicable to this technology. Lucent has been a prime mover behind the efforts to develop an industry standard for this high-speed modem technology. The company has submitted several of its key technical proposals. We plan to continue to work closely with the ITU until the standard issue is resolved.

Bob Rango
General manager
Modem and Multimedia
Integrated Circuits
Lucent Technologies, Inc.
Huntington Beach, Calif.

Microsoft misrepresents NT

THIS LETTER IS IN RESPONSE to *Computerworld*'s article, "Users to Microsoft: NT 4.0 still needs work," in the Sept. 15 issue. Microsoft has used third-party software as a crutch for quite some time. DOS and Windows 95 have many utilities that are made by companies other than Microsoft. One of the really sneaky things Microsoft does is to show how much cheaper NT is than some of the Unix competitors and OS/2. The claims are misleading because of the large cost involved in buying enough extra software to get a manageable operating system with NT. They also leave out the fact that server crashes and downtime are very expensive to companies and that OS/2 and Unix systems are much more stable.

Ricky Hardt
Houston

Entering modern era with net PCs

FRANK HAYES' COLUMN ["Showdown at the PC corral," CW, Sept. 15] paints a fearful picture of MIS management at Wells Fargo. It serves as a warning to management not to take away benefits (pay, time off, tools and so on) from its employees without anticipating backlash. For this, I am appreciative.

But his conclusion that "If there's a single issue that can shatter your hopes of successfully putting network computers on your users' desks, it's the fact that you'll be taking their PCs away," is flawed. Typewriters and adding machines are not network computers. Wells Fargo removed their PCs without giving them network computers.

Also, you assume a network computer is not a PC. It certainly doesn't have to be, but it can be. We rolled out network PCs at my company recently. Yet, no one who had a PC complained because we didn't take it away from them. We installed a single Citrix WinFrame server (Windows NT 3.51, with extensions for multiuser capacity) and installed client software on existing PCs.

We eliminated the need for constant upgrades of everyone's desktop system's hardware and software. We've entered the modern era (albeit with NT 3.51, for now), leaving the stagecoach in the dust.

Robert Taylor
Thermeon Corp.
Santa Ana, Calif.
rtaylor@thermeon.com

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You can read a knee-high stack of computer magazines each month and still not find the depth and breadth of news and information you'll discover each week in the pages of *Computerworld*.

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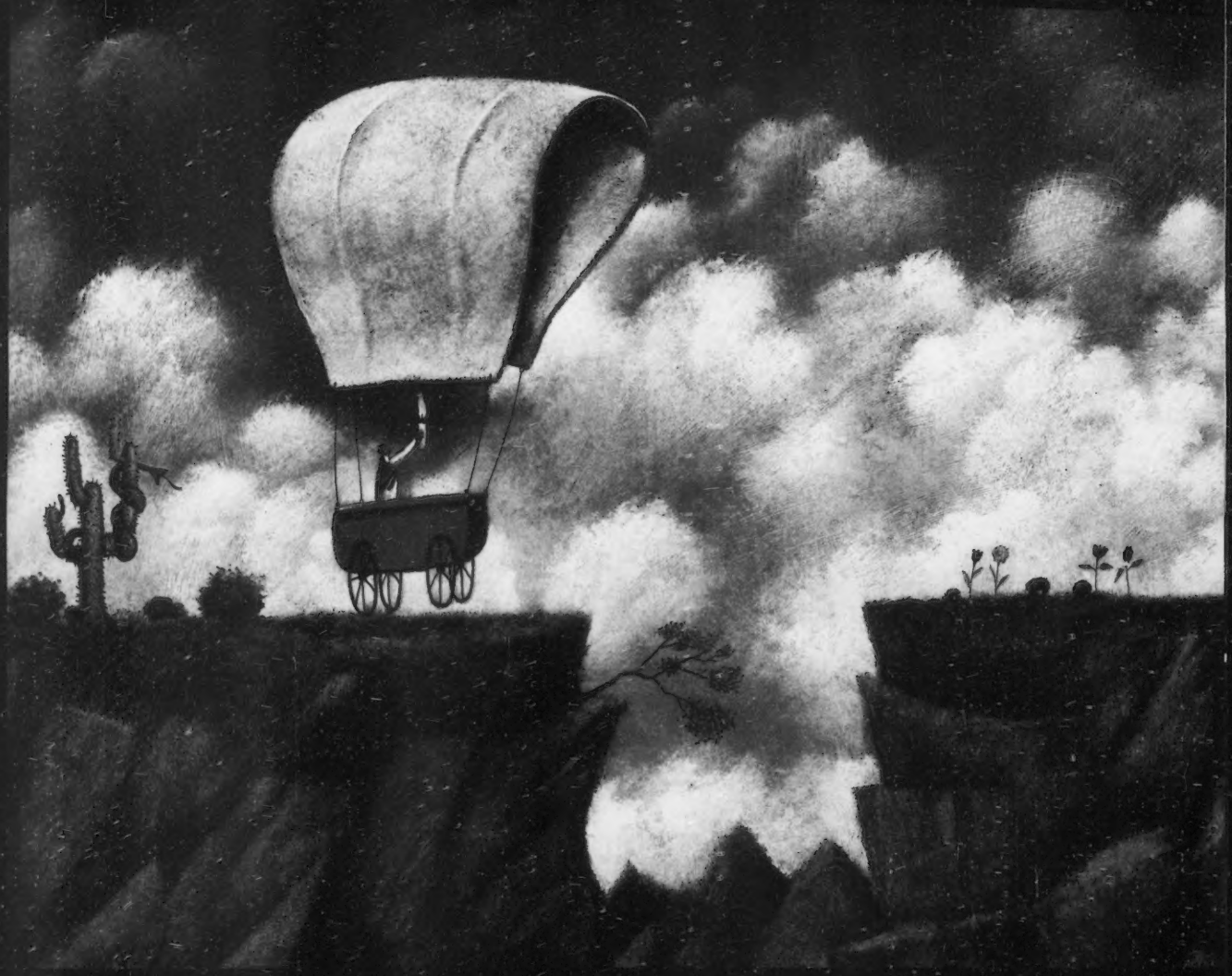

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Corporate Strategies

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Briefs

EDS contract grows

The U.S. Immigration and Naturalization Service has increased by $47 million the amount it is paying Electronic Data Systems Corp. to develop systems for projects such as case tracking and employment verification.

In 1994, the agency awarded EDS part of its five-year, $300 million Information Technology Partnership contract.

CSC takes aim

Computer Sciences Corp. in El Segundo, Calif., has launched a new consulting practice aimed at the chemical, oil and gas industry.

The group will have 3,000 specialists worldwide, including 2,600 chemical-industry specialists in 18 countries that CSC acquired through an outsourcing contract it signed this year with Du Pont Co. The group will focus on year 2000 services and supply-chain management implementations

Enabling E-banking

Integrion Financial Network, a consortium of IBM and top U.S. banks, has formed a joint development effort with Intuit, Inc. that's intended to allow financial institutions to connect users of Intuit's Quicken personal financial management software with Integrion's Interactive Financial Services platform.

Under the partnership, the two plan to develop by mid-1998 a server technology designed to translate Quicken financial software transactions into Integrion's Gold Standard messages.

LABOR COSTS

Because labor accounts for roughly 50% of IT budgets and staff compensation increases will reach 15% to 20% per year through 2000, IT budgets must grow more than 10% per year just to handle labor increases.

Source: Meta Group, Inc., Westport, Conn.

IT churn concerns IS

By Matt Hamblen
ORLANDO, FLA.

INFORMATION SYSTEMS managers feel overwhelmed by technological change, especially in software upgrades, and worry about justifying the costs to higher management.

The anxiety showed itself at Gartner Group, Inc.'s symposium recently. Two chief information officers appeared on a panel before thousands of information technology managers and said that the productivity gains from computers are tough to measure — especially when the product upgrade cycle is relentless.

Their comments came amid a flurry of recent press reports questioning whether computers make companies more productive. Some Wall Street analysts and even Federal Reserve Chairman Alan Greenspan have called for changes to the way economists measure productivity gains from information technology.

Nabisco's Joseph W. Farrelly: "The time spent on upgrades is enormous"

Meanwhile, experts such as *Computerworld* columnist Paul A. Strassmann continue to argue that productivity hasn't improved much in the past 10 years despite the billions of dollars invested in computers [CW, Sept. 15].

Joseph W. Farrelly, CIO at Nabisco Holdings Corp. in Parsippany, N.J., said, "The time spent on upgrades is enormous." Companies need help from vendors with time-saving technologies, for example, to help their users keep pace with new software releases, he said.

IT churn, page 43

Feds plan to check ID at Web site doors

By Sharon Machlis

THE FEDERAL government will soon seek proposals to develop a secure way to identify users of government World Wide Web sites.

The request for proposals, expected as early as next month, will include plans to distribute software or hardware "tokens" aimed at ensuring users are who they claim to be, General Services Administration officials told a government security conference earlier this month. The tokens generate one-time passwords, which makes password-stealing efforts pointless.

The GSA's Stan Choffey: The proposal will have two levels of security

The system would use a public key infrastructure (PKI), which uses special key pairs — one private, one public — to encrypt and decrypt data. Any government agency could use the resulting system to more securely provide data to the public over the Internet.

The PKI project, which would be for government use only, mirrors attempts by the private sector to find a method of authenticating users in electronic-

Feds, page 43

Lawsuits galore

▸ *Lawyers 'slobbering' over upcoming year 2000-related litigation*

By Julia King

IF YOU ARE a year 2000 project manager, do yourself a favor and get to know your company's lawyers. Really well.

You will probably need them during the next few years, when the cost of year 2000 litigation is projected to exceed $1 trillion, according to a study by Thelen, Marrin, Johnson & Bridges, a law firm in San Francisco.

Attorneys are "actually slobbering" over the prospect of year 2000 lawsuits, said Steven L. Hock, a Thelen attorney who specializes in technology law.

"If legal issues aren't addressed up front, it's the year 2000 project manager who will end up on the hot seat in the witness box," Hock said.

The first rule for project managers is document everything carefully. That includes conver-

Lawsuits, page 43

YEAR 2000 LITIGATION AVOIDANCE TIPS

- Don't rely on end users to test repaired software code.
- Don't make functional software changes during year 2000 work.
- Establish a separate year 2000 project management office to track and document all work.

Legacy code is recyclable

By Jaikumar Vijayan

OLD SOFTWARE doesn't always have to die. Sometimes, it can just get recycled.

At least that's what has happened at St. Louis-based McDonnell Douglas Corp. Two years ago, the giant government contractor wanted to create a new contracts management system to manage the many reporting requirements on each of the thousands of active contracts that McDonnell Douglas handles.

But instead of developing a new system, the company reused core functions from its legacy environment, added new functionality and rehosted them in a client/server application.

The move not only helped McDonnell Douglas preserve parts of its legacy investment, it also helped the company cut its application development and implementation cycle in half, according to Randy Simmons, a controller at the company.

Such considerations are important for corporations wanting to move to new distributed

Legacy, page 43

McDonnell Douglas' contracts management system

Business objective: To create a uniform, corporatewide contract management system.

Challenge: To move and merge four mainframe-based contract management systems into one client/server-based system.

Solution: To reuse legacy mainframe applications as much as possible.

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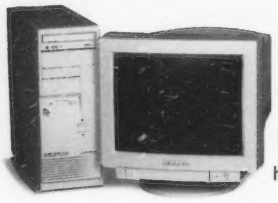

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October 20, 1997 • Volume 3, Issue 10

COMPUTERWORLD

·Leadership Series·

From the Editors of Computerworld

By M. Lynne Markus and Robert I. Benjamin

Are You Gambling on a Magic Bullet?

Do you believe in magic? Managers who think technology alone can magically improve their business inevitably crash and burn.

FoxMeyer Drug Co. gambled on information technology — and lost.

When the Carrollton, Texas-based company decided to replace its legacy mainframe systems in a $65 million enterprise resource planning (ERP) project, Chief Information Officer Robert Brown told *Computerworld*: "We are betting our company on this." [CW, Sept. 5, 1994.] Just a few years later, after the system failed to deliver the expected benefits, the pharmaceuticals company filed for bankruptcy and sold off a major business unit to a key competitor.

The real culprit in the FoxMeyer Drug story is not IT, ERP or client/server technology. It's unrealistic, "magic bullet" thinking about IT and its benefits by information systems managers and line executives.

Magic bullets are technologies and methodologies that people believe can do remarkable things with little or no human intervention. *Computerworld* readers are more familiar with magic bullets than most people, because the IT industry produces them at a very rapid rate. Examples include client/server architecture, object-oriented programming, Java, outsourcing, re-engineering and enterprise packages. In our research and consulting, we have learned that belief in IT's magical powers is widespread and plays an important role in IT project failures — and even business failures. Are you and your line management colleagues betting your company on IT? And if so, is it a calculated risk or a reckless gamble?

The details of the FoxMeyer Drug story show that only some of the blame can be traced to technical problems. In the middle of the ERP implementation, for example, the company had the bad luck to lose a key customer that accounted for 15% of its sales. But a closer look at the project reveals a series of risky management decisions, which can be traced to the company's "magical thinking" about the power of IT.

RISKY BUSINESS

Among the risky bets FoxMeyer Drug placed were these:

- FoxMeyer Drug, a business with very tight margins, embarked on a second high-risk IT project simultaneously with the ERP implementation. It was an $18 million state-of-the art computerized warehouse, which encountered severe technical problems and led to inventory losses of more than $15 million.
- In an attempt to regain lost sales, FoxMeyer Drug's managers signed a contract for a new customer on the assumption that a projected $40 million in benefits from the ERP implementation would be realized right away.
- To accommodate the new customer, FoxMeyer Drug pushed the deadline for the ERP implementation project forward 90 days. This meant it could not reengineer business processes and reap the attendant savings. IT specialists responded by cutting short the testing of modules that hadn't been modified.

The results were predictable. FoxMeyer Drug's ERP started up on time and customer orders were filled. But widespread data errors led to inaccurate customer sales histories, thereby limiting the company's ability to benefit from forecasting inventory needs. Ultimately, the firm realized only half the projected savings.

"In hindsight," said the company's new CIO, Douglas Schwinn, "I'd stand up in front of the board of directors and say, 'Don't spend that money.' " ("A Cautionary Tale: FoxMeyer's High Tech Gamble," *The Wall Street Journal Interactive Edition*, Nov. 18, 1996.) But at the time, both then-CIO Brown and FoxMeyer Drug's line managers gambled on the magical ability of IT to deliver enormous benefits with a minimum of risk and effort.

FoxMeyer Drug's executives were not alone in believing in IT's magical powers. We've found similar patterns of thinking among both IT specialists and line managers in many companies. The tragedy of the "Magic Bullet Theory of IT" is that it lulls executives into a false sense of security in which they don't take adequate steps to prevent failures and ensure success.

Research conclusively shows that good change management skills can substantially increase the odds of IT project success. Yet it is also clear that best practices in change management, although known, are not widely used by IT specialists or their line management clients. IT executives and consultants often do not employ these practices because of magic bullet thinking.

Altogether, there are three different models of what it means to be a successful agent of IT-enabled organizational change. We call these models the Tool-Builder model, the Facilitator model and the Advocate model. All three are appropriate in different circumstances; the odds of success are highest when IT and line executives know and practice all three roles. But in our conversations with IT executives and consultants, we found that the Tool-Builder model was heavily overused in ways that reduced the odds of success.

Illustrations by Scott Menchin

Change agentry is a contact sport of a different sort, explain M. Lynne Markus and Robert I. Benjamin.

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The Tool-Builder Model: "IT is Magical"

Many people who work with IT claim to be "change agents." But what they usually mean is that the IT they implement will create favorable organizational change. They believe that IT changes people and organizations by empowering them to do things they couldn't do before and by preventing them from working in old, unproductive ways. Therefore, the people who initiate, design, build or install this powerful, magical technology are "agents" of organizational change.

"We bring you Lotus Development Corp. Notes, and you will collaborate." "We bring you an enterprise logistics system, and you will save time and money." "We bring you data warehouses, and you will make better decisions."

The belief that IT makes benefits happen glosses over the great shifts in users' knowledge, skills and routine workplace behaviors that are needed for improvements in organizational performance. No matter how magical the bullet, someone has to aim the gun and pull the trigger. Tool builders don't do that; they just build the guns and the bullets. But somebody (actually, many people) in the organization has to take responsibility for the training, coaching, redesign of business processes and new managerial behaviors needed to get IT's promised results.

Successful organizational change is a contact sport. Change is not produced by planners planning, designers designing and funders funding. Rather, it is the result of hard, interpersonal work by all the actors in the change drama, where the tactics can range from infinite patience to the use of metaphorical two-by-fours. The magic bullet theory's seductive appeal is that it will do the hard, contact sport work for all of those who prefer disembodied ideas to "in-your-face" contact with the users who are targets of change.

The Tool-Builder model of IT change agentry does not even recognize the need for the contact sport of change. It does not specify who, if anyone, should go out on the playing field. It assumes that the hard work of change can be accomplished without human intervention, as if by magic.

Quite frankly, that's a message many busy executives like to hear (especially if they are still ignorant about, and intimidated by, IT). Not surprisingly, line managers who listen to tool builders can easily feel justified in shifting the burdens of change onto the technology itself. Unfortunately, however, IT really isn't magic. When line managers eventually realize their mistake, it's often too late to prevent an implementation or business failure. Any wonder, then, that many line managers blame IT specialists when things don't go as planned?

Magic bullet thinking in IT implementation is like a Hail Mary pass in football: It's better if you don't have to use it. So, it's useful to know the alternatives to the Tool-Builder model.

The Facilitator Model: "People Work Wonders"

Organizational development (OD) specialists also frequently refer to themselves as change agents. When you listen to them closely, you find that they mean something very different than "tool builder" by this phrase.

Whether they are consultants or staff members, OD specialists are concerned with improving the effectiveness of human systems at all levels: work groups, organizations, interorganizational alliances. They view themselves as facilitators of others' efforts to create change. The basic belief is that people, not technologies, make change. Even facilitation and other "soft" skills cannot produce change. At best, they help people take responsibility for making change happen and empower them by surfacing information they need to make informed decisions about change. OD facilitators stay out of the content of the decisions they facilitate as a matter of principle: They do this to avoid exerting unfair influence on their clients' choices.

MUCH TO GAIN

IS executives and specialists have much to gain by judiciously adopting the change facilitator role in large-scale IT projects. At a minimum, adopting the change facilitator role brings together the factors necessary for IT success: sound ideas for the use of IT to improve performance, well-built and supported technologies, conditions that foster effective IT use and knowledgeable users. Broadly, being a change facilitator helps managers and users test the feasibility of proposals for change before the search for technical solutions begins. (FoxMeyer Drug's new CIO claimed he would tell the board of directors today: "Don't spend that money [on ERP software and state-of-the-art warehouse automation]... There are cheaper ways to do it. There are better ways to do it that aren't quite as technologically advanced. ")

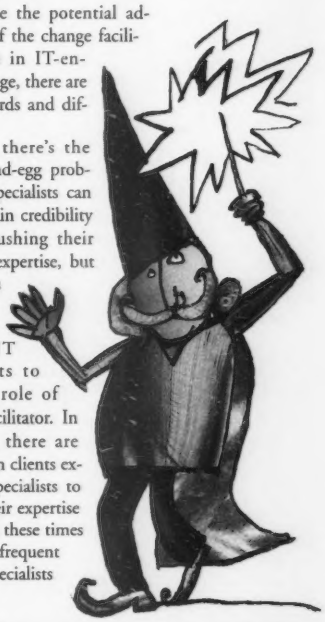
HELPING CHANGE

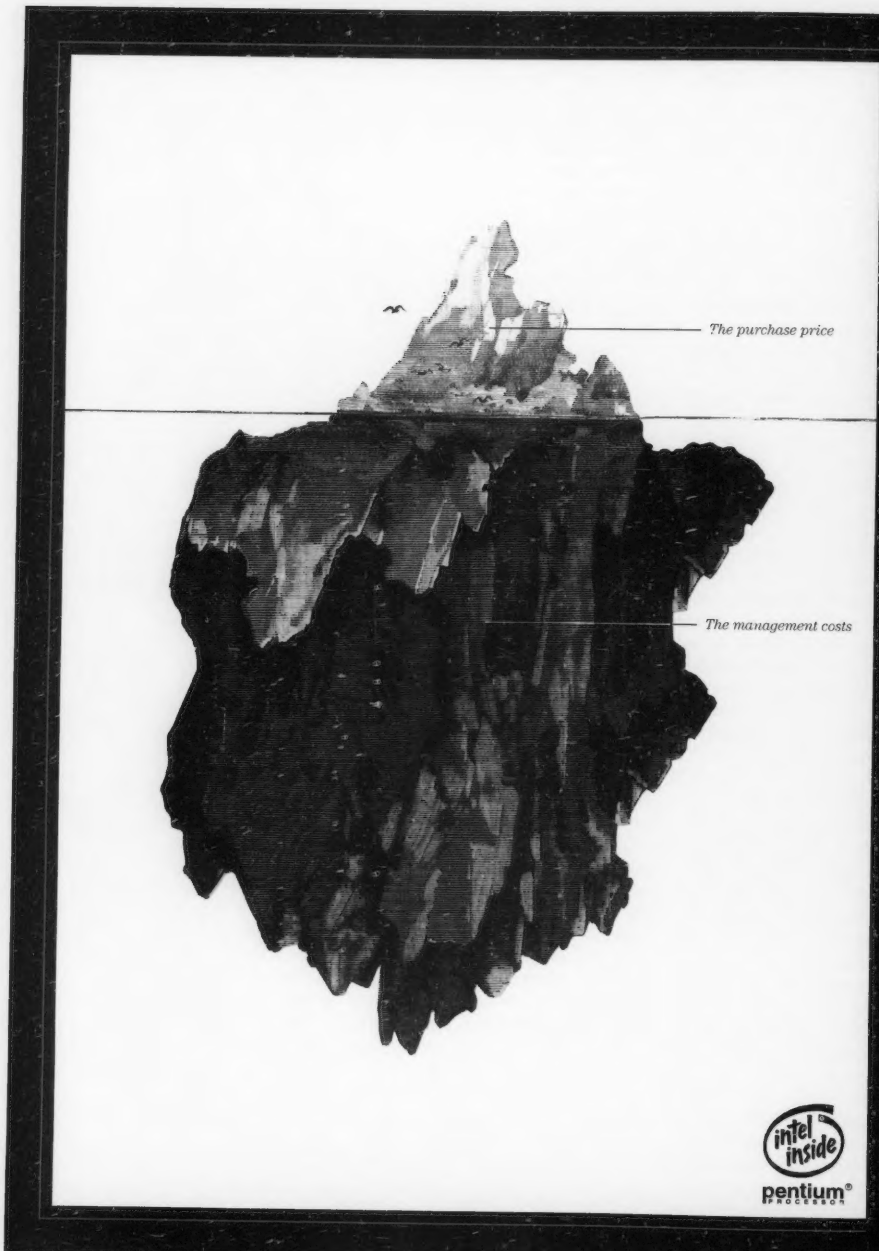
Where might change facilitation help in cases of IT-enabled change?

- IT projects often run into trouble when internal clients and users interpret IS' technical expertise as self-serving advocacy. A neutral facilitator would not endorse a particular solution, but would instead help clients make informed decisions based on valid information about the alternatives and their pros and cons. (Valid information means that IS clients would know, for example, that a particular technology reduces costs for the IT group but increases costs for users.) We believe if more IS executives and specialists behaved like facilitators in technology choice decisions, then conflict between specialists and clients or users would wane and more projects would be successful.
- IT efforts often fail to yield their intended benefits because line executives fail to take full responsibility for ongoing user training and support. In some cases, these tasks do not fall within the IS budget. Nevertheless, success depends on these tasks being performed well. In cases like these, IT specialists can help by educating managers tactfully about implementation requirements and helping managers find the resources to get the job done.
- Many newer information technologies such as Lotus Notes and the Internet do not require the same heavy investments in development as traditional transaction-oriented systems. At the same time, users may require much more education and support to employ the new groupware technologies productively than they would for familiar technologies. IT specialists can act as change facilitators by documenting and disseminating information about effective user-developed practices with collaborative technologies throughout the organization.

Despite the potential advantages of the change facilitator role in IT-enabled change, there are some hazards and difficulties.

First, there's the chicken-and-egg problem. IT specialists can actually gain credibility by not pushing their technical expertise, but it requires some credibility for IT specialists to play the role of neutral facilitator. In addition, there are times when clients expect IT specialists to display their expertise — though these times are not as frequent as most specialists think.

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The Advocate Model: "You've Got to Make Them Think"

Successful business and technical leaders often refer to themselves as change agents, but they mean something quite different from either the Tool-Builder or the Facilitator model of change agentry.

Change advocates know that facilitated empowerment often results in more of the status quo. A change of mind and heart is required for real change to happen. The role of a change advocate is to envision what is needed to get the organization on track and to get everyone else to see that vision, too. They don't worry about elegant tools or staying on the sidelines while people work things out. They neither flaunt nor conceal their technical expertise; they don't worry about exerting too much influence on how others see the world. Their model of change agentry is best described as "whatever works." Overt persuasion, covert manipulation, symbolic communication and even the naked exercise of formal organizational power (when the advocate has it, which is not always the case) are all acceptable tactics for achieving change. At the same time, successful change advocates understand they work with and through people and

An Advocate in Action

By changing hearts and minds, one change advocate added $500 million to his company's bottom line

When the CEO of a business equipment manufacturer learned that slow inventory turns were hurting profits, he charged a distribution executive with an IS background with reducing inventories by improving the worldwide inventory management process.

The advocate rejected line responsibility and chose to build a team of 30 change agents — experts in IS, distribution and organizational development. The team defined a vision and a clear road map for fulfilling it. Then they created a simple, unified company inventory measure. The advocate subsequently convinced the CEO to give bonuses to his top 20 executives if they drove down this measure.

Once the incentives were in place, the team focused on obvious quick fixes, such as transferring inventory from countries that could not move it to those that needed it. The team's IS experts provided simple inventory summary reporting that facilitated inventory sharing across the company. Meanwhile, the team's senior members kept encouraging and assisting the business unit leaders.

These early successes paved the way for a tougher step: changing the production planning process. For years, inflexible, 26-week production schedules were set by the top manufacturing, marketing and procurement executives. The team could see that empowering middle managers and plant managers to plan production every week would keep inventories in line. The only obstacle was fear: Managers were afraid of making mistakes, executives of losing control.

The team's IT experts developed a simple production decision-support system. To keep executives happy, the system alerted mid-level managers when they had crossed thresholds that required them to seek approval for their decisions. Facilitators supported the managers' weekly meetings by walking through the data and clarifying the decision issues. In time, the managers' confidence grew. Savings came to exceed expectations, and the new approach spread worldwide.

The moral: *Change agents are agents of organizational change, not agents of technology.*

often make sure others get all the credit for success.

SHOWING THE WAY

In an IT context, the successful change advocate shows people the kinds of IT they want and need as well as how to use IT to get results. One CIO we know built and demonstrated small prototype systems to his clients to get them thinking about organizational improvement opportunities. Another type of advocate would preach the benefits of IT skills testing and training for users. Practiced astutely, the change advocate role can create consensus among line managers about the need to invest in IT infrastructure today to get business results tomorrow.

As with the facilitator role, change advocacy has pitfalls and inappropriate uses. For example, it may work best in organizations in which IT is viewed as primarily supportive rather than strategic. It probably works better when the role of the IT function is more advisory than control-oriented. And it can be deadly in multidivisional companies with strong general managers and a CEO who wavers on questions of shared IT needs.

Conclusions

Despite all that is known about IT success, many projects still fail. Why? IT and line executives often hold magical beliefs about the power of IT, and these beliefs are reflected in what they see as their own and others' roles.

The result may be that no one accepts responsibility for playing the contact sport of change. Then IT fails, nobody learns and more failures are likely in the future.

Effective change management is everyone's job. IT executives may not officially be responsible for educating users or convincing line managers of the need for change. But to remain in the Tool-Builder role while these things do not get done is a recipe for failure. Today's IT projects are so large and complex that they're "bet-the-company" propositions. They cannot succeed if people only do their own jobs well; everyone must make a direct contribution to the desired final result. This means line executives must take more responsibility for IT than they often do today and, at the same time, IT specialists must take more responsibility for making the business a success.

IT leaders cannot just build tools. They must also facilitate people and try to change their minds. But first, they must examine their own beliefs and understand how magical thinking about IT's power can lead to IT failures.

The ideas presented in this article are developed further in "The Magic Bullet Theory in IT-Enabled Transformation," M. L. Markus and R. I. Benjamin, Sloan Management Review, *38, 2 (Winter): 55-68.*

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Lawsuits galore

CONTINUED FROM PAGE 41

sations and agreements with software and hardware vendors as well as your own business users. Any and all documentation of year 2000 problems and solutions works to indicate due diligence, Hock said.

But there also is a pitfall. Opposing attorneys can and will use that same documentation against you in court. A rogue electronic-mail message from a colleague expressing concern about inadequate testing procedures or a casual comment about problems hiring Cobol programmers can come back to haunt you. That's why it is critical to review and control all correspondence and, in some cases, discard and delete documents and electronic files.

"IS managers will see E-mails blown up the size of a barn door in the courtroom. So if you have concerns, take them to your in-house attorney," Hock told year 2000 project managers who attended a recent Project Leadership Conference in San Francisco.

Last week, an informal poll of a half-dozen year 2000 managers showed that most are keenly aware of the higher-than-usual risk of legal problems on century-change projects. As a result, some have altered standard project procedures.

Software testing is a project manger's best and last defense, and it should comprise at least 50% of a company's year 2000 effort, according to Ian S. Hayes, a year 2000 expert and principal of Clarity Consulting, Inc. in Marblehead, Mass.

At Union Pacific Railroad in Omaha, "we're absolutely documenting this project differently than others," said information systems director Jim Fox. "We're making sure we keep every piece of paper or document we collect," he said.

Those pieces of paper include contracts, purchase orders and all correspondence with product and services suppliers, such as banks and insurance companies.

"We're also sending out letters to all cities where we have major operations and asking them what they're doing about the year 2000. We're covering our bases for the sake of due diligence," Fox said.

Nevertheless, he said, "we suspect there will be litigation, but we'll be so well-documented that we'll be difficult to litigate."

At Atlantic Energy, Inc. in Pleasantville, N.J., project manager Chris Arena had his team hand-deliver, rather than E-mail or post, year 2000 risk assessment surveys to 80 different managers in the $1 billion utility's business departments. Managers were asked to list all applications they used and to rank the level of damage that any problem with an application would cause.

"Those are the kinds of questions that I can't answer in IS, but people in the business unit can answer," Arena said.

The survey may one day prove useful in a courtroom as well.

"From a legal standpoint, if all hell breaks loose, we can show we made an honest attempt" at finding and fixing the problems, Arena said. □

IT churn concerns IS

CONTINUED FROM PAGE 41

"It's a very serious issue. Zero administration or push-button deployment [of software upgrades] is very important," Farrelly said.

James Dixon, CIO at Atlanta-based NationsBanc, Inc., said the complexity of technology will become a bigger issue as it gets more difficult for end users to adapt to constant upgrades. "We have to deploy things which enable our [workers], so the speed of deployment will be a larger issue" as time goes on, he said.

One of the biggest rounds of applause by the more than 7,000 IT managers at the symposium came when Mitchell Kertzman, CEO of Sybase, Inc. in Emeryville, Calif., wondered aloud, "What if customers want technology that works for a long time? We think our customers want new technology, so we keep throwing change in to make it attractive."

Kertzman said the software industry needs to be ready if there is a backlash against constant updates. He said his company has intentionally stretched its product cycles.

Dixon said that with NationsBanc's $2 billion annual IT budget, investments "have to result in satisfying customer needs."

Dixon added: "The dollars and focus [in the future] will be spent on when you are enhancing the customer experience or enabling the associate to do that. If that's the case, then you are going to spend as much or more time on making sure that the last rollout is being used effectively."

Farrelly said productivity from IT is hidden, but it is seen most clearly in the ways software helps the company do real-time ordering and production.

Electronic-mail and collaboration tools also have helped cut down the company's product cycle, Farrelly said.

Some IT managers said IT is viewed as the great hope for their growing companies, so they feel pressure to find the newest innovation that will grant their companies a competitive edge. □

Feds plan to check ID

CONTINUED FROM PAGE 41

commerce transactions that is both secure and easy to use.

The PKI was designed to ease fears that posting government data on the Internet would invade personal privacy by letting people tap in to sensitive information about others.

But some attendees at the National Information Systems Security Conference — where the GSA outlined the project — questioned whether the proposal's requirement that users pick up software "tokens" in person to help verify their identity, might limit the number of people who would visit government sites.

The requirement is left over from an earlier project designed to create a system secure enough for electronic funds transfer.

"The agencies said that [approach is] 'too secure' and too expensive," said Stan Choffey, chief technical manager for the PKI project at the GSA. "We learned a lesson from that."

The new request for proposals will feature two classes of certification, which Choffey referred to as "classic" and "gold" — with just the gold requiring such hardware-based high security and a requirement that users appear in person to get tokens.

BUSINESS MODEL?

In the corporate world, some companies already use tokens to let remote employees or strategic business partners access sensitive data over the Internet. It is unclear whether the government system might serve as a model for businesses, like a digital-certificate system first employed by the Canadian government that has been used by at least one major financial institution there.

The GSA will seek one or more commercial vendors to build a public key infrastructure to manage the keys needed to send and receive encrypted data.

Users of early pilot projects said the projects have proven helpful. Back in 1988, for example, initial electronic contract proposals for the government were also submitted on paper. Then, employees had to manually check that the electronic versions matched the formal paper one, an extremely time-consuming process because documents could approach 1G byte in size, according to Monette Respres, a systems administrator at Mitretek Systems, Inc. in McLean, Va.

The FTS2001 Secure Electronic Procurement System used digital certificates, not manual labor, to verify the integrity of electronic documents, Respres said, taking just minutes to verify a 1G-byte table. The savings were "immeasurable in time and accuracy," she said.

But at an earlier panel on PKI, attendees were cautioned to be realistic about their timetables for getting a project online.

Early schedules for rolling out the Secure Electronic Transaction (SET) standard were "optimistic," said Ann Terwilliger, project manager for certificate-related SET activities at Visa International, Inc.

"There will be unexpected problems," Terwilliger warned. "It's all too new. ... It will take patience. It will take persistence. It will take flexibility." □

Legacy code is recyclable

CONTINUED FROM PAGE 41

environments while maintaining their huge investments in costly, rapidly aging legacy systems, analysts said.

"You would prefer to use as much existing code as possible because it is cheaper," said Bob Tasker, an analyst at The Yankee Group in Boston.

But a lot depends on the environment, he said. For instance, it is easier to move from a Cobol environment to a new one because Cobol is more portable than other languages, Tasker said.

The move to consolidate the contracts management system was part of a larger reorganization McDonnell Douglas launched in 1994 to provide uniform, companywide information systems based on business practices shared across all business units.

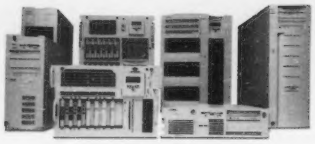
To manage its contracts, for example, McDonnell Douglas had four different systems residing on mainframes in nonrelational databases. The company has primarily relied on IBM mainframes, Cobol applications and IMS and DB2 databases. To migrate to a client/server environment, the company chose International Integration, Inc. (I-Cube), a Cambridge, Mass.-based systems integrator.

Using a proprietary set of transformation tools and methods called I-Structure, I-Cube took apart each of the legacy applications, containing more than a million lines of code, and reassembled them in a new environment in a three-stage process.

In the first stage, the company divided the old application into its smallest logical components, such as data types, presentation attributes and application logic.

The components and other application information were then reassembled using things such as relational databases, transaction monitors and graphical user interfaces.

The system integrator took applications running on IBM MVS mainframes using 3270 text-based terminals and legacy databases and migrated them to a Unix environment, with graphical interfaces based on Visual Basic and C++. □



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Doing IS at the bottom of the world

By Roger Dennis

DOING INFORMATION technology stints in Antarctica can be the most daunting — and the most fulfilling — experience of a career. But according to those who have done technology stints in Antarctica — and those who have hired them — it takes a very special set of skills to succeed.

Currently at the U.S. Antarctic base, called McMurdo, is Keith Conrey, the assistant manager for information systems with the U.S. team. He has spent many summers at "the ice", with the upcoming season being his third winter. Fewer than 1% of Americans will ever get the opportunity to go to the ice, Conrey says, and when the situation arose, he jumped at the chance.

"There seem to be two sorts of folks when it comes to deploying to Antarctica. One sort, the larger group, thinks the idea is preposterous. The other group thinks it sounds like a unique experience that just can't be missed. I'm in this second group," said Conrey, a former IS manager at a large defense contractor.

Hermione Binnie, an electrical engineer who has worked with a wide range of technologies, is just beginning a yearlong excursion as a technologist on Antarctica with the New Zealand contingent. Binnie said that getting down to the ice has been a goal of hers "since I was very short. My dad was snow mad and, apparently when I was 3 months old, I was out in the snow."

Both Binnie and Conrey, their bosses say, have what it takes to succeed in a place where many don't even wish to visit, much take leave of their families for an average of five to seven months. The hours are long, six-day weeks aren't uncommon, and a wide range of hardware and software expertise is essential.

Jim Johnson is responsible for hiring IT employees for McMurdo. Johnson is based in Denver and works at Antarctic Support Associates (ASA) as assistant data manager. Johnson said about 65% of successful candidates reapply the next year for another slot.

The U.S. has one of the largest bases on the ice and a correspondingly large IT department. In the quiet months of winter, only 18 people look after the system, but that swells to about 75 in the busy summer season.

There are negative aspects to the job. Conrey said the base is a very closed community, as many people return season after season and form long-term friendships. The nature of the accommodations means that often you will have a shared room, with the accompanying loss of privacy.

And adjusting to life on the ice can be tough. Conrey said that, like a lot of first timers, when he arrived, he kept a journal. "When I re-read that journal now, my first reaction was about what you'd experience if you left the planet and landed somewhere else. ... I had to learn everything from scratch — how to open the door handles, how to dress for the weather, where to go to eat, everything."

TARA WINGFIELD

Working in Antarctica, Hermione Binnie (left) and Keith Conrey find adventure on the ice

However, it is those conditions that combine to make the Antarctic a unique place to work, and Conrey said that results in a special type of people working at the ice. "The kind of people down here are the same type that will be on the first big space station," Conrey said.

Antarctica New Zealand, the government agency that runs the country's research program at the ice, operates one main facility called Scott Base.

"It's quite important to find out why people want to go down," said Paul Woodgate, movements controller for the New Zealand crew. It is part of his job to select IT applicants for Scott Base. Some applicants go for the unique experience of living in Antarctica, he said, whereas others may go to escape relationships and other pressures at home.

In addition to Binnie, the other New Zealand technician going down over the summer is Grant Redvers.

The effect of the experience on the ice can't be denied. Conrey said that the Antarctic is now in his blood. "I will keep coming back here as long as I can, which means as long as my family can stand the long separations." □

Dennis is a freelance writer in Christchurch, New Zealand.

Salaries for American IT workers at McMurdo are paid according to an annual survey of relevant positions in the Denver area, and a bonus is awarded for completing the contract. Bonuses are directly related to time spent at the ice – those there for the first time receive 16% of base weekly pay for every week on the ice, rising 2% each year until it caps out at 24%. On the New Zealand side of the fence, the average age of successful candidates is 28, with a "good split" between married and single people. As to the gender mix, this coming winter, three out of the 10 IT workers at Scott Base will be women.

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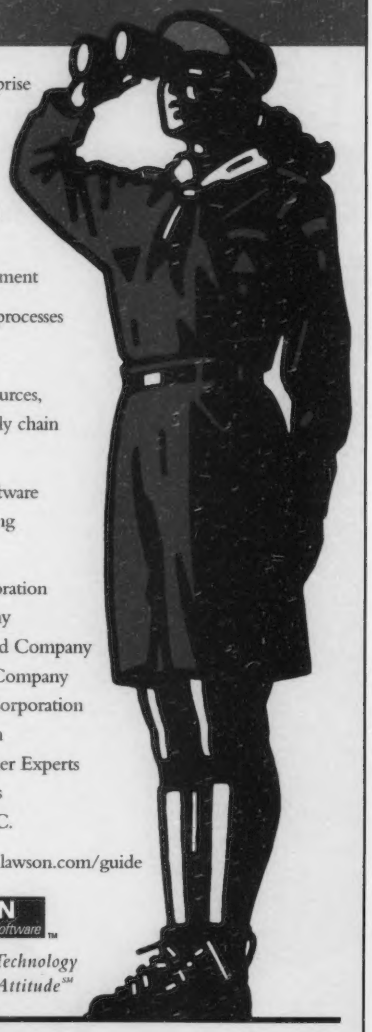

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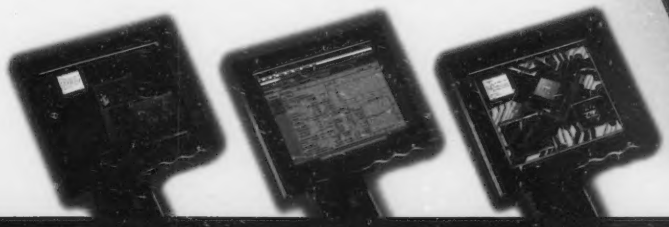

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Briefs

Help desk on the Web

Mountain View, Calif.-based Remedy Corp. this week will announce the Java version of Flashboards 2.0, which will enable information systems managers to use World Wide Web browsers to better track help desk performance across platforms.

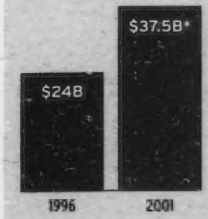
Flashboards works with Remedy's Action Request System, which is used for automating help desks. Flashboards' Java version, available next month, will cost $16,500 and will include the server, five user licenses, a proxy server, the Java client and an Action Request System performance monitor that monitors the Action Request System servers.

Mitnick wants a PC

Superhacker Kevin Mitnick may be allowed to use a computer to prepare his legal defense against 25 computer and wire crime charges. A federal judge initially planned to prevent Mitnick, who is considered highly dangerous at a keyboard, from getting near computer equipment. But the judge may be swayed after Mitnick's lawyer argued that it was impractical to print out paper versions of all documents relating to Mitnick's case. The computer wouldn't have a modem, the attorney pledged.

SPECIAL MARKET

The market for specialized business online services, such as those aimed at financial and health care professionals, will increase **55%** from 1996 to 2001



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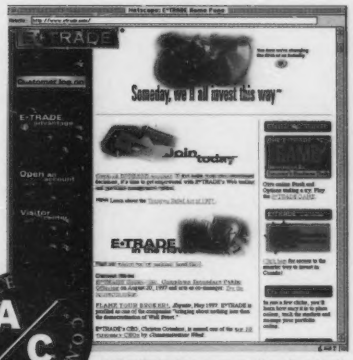
WEB REVIEW▶ *Investment sites*

Schwab impresses

By Paul Gillin

THE WEB is teeming with investment advice, but online brokerages seem to fall at opposite ends of the information spectrum when it comes to their public sites.

From Charles Schwab & Co.'s gold mine of analytical treasures to Merrill Lynch, Inc.'s bare minimalist approach, they either entice the public with information jewels or lock the good silver in the cabinet and entice visitors to subscribe.



E-Trade's home page is aimed at getting you to sign up

SCHWABNOW

Charles Schwab in San Francisco is the 800-pound gorilla of the online trading business, and it's easy to see why. The company spares no expense to attract prospective customers with a mother lode of information services. The strategy is clear: Schwab wants to look like the only source investors will need to manage their finances.

The home page is admirable for its restraint and freedom from graphics clutter. Once you get past that, though, the design is somewhat inconsistent. Without paying a fee, viewers can check the performance of 1,300 mutual funds and link to prospectuses. An impressive online trading demo lets you step through the process of executing a trade, right down to placing and tracking an order. But after you're in the demo, there's no intuitive way to get out.

It is an effective means of highlighting the service's ease of use, though.

Web review, page 51

Tool makes the Web active

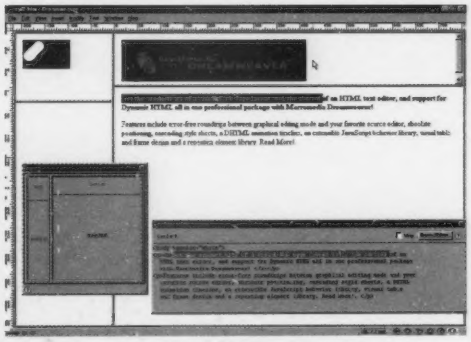
▸ *Dreamweaver is first design product to support dynamic HTML*

By Nancy Dillon

THE BEAUTY OF Macromedia, Inc.'s new visual World Wide Web authoring tool, Dreamweaver, is that it automatically generates "cross-browser" dynamic Hypertext Markup Language (HTML), according to Web designers.

Dynamic HTML is a new model of HTML that lets users create simple animation without arcane programming.

The San Francisco-based company's tool is the first in a wave of Web design products that will offer dynamic HTML support. Microsoft Corp.'s FrontPage 98 will ship in November with dynamic HTML support. But animations created with it will work only with Internet Explorer 4.0. Dynamic HTML support also is planned for future releases of Fusion from Redwood City, Calif.-based NetObjects, Inc. and PageMill from San Jose, Calif.-based Adobe Systems, Inc.



Dreamweaver includes an animation time line, a layers palette and a library of JavaScript behaviors

"We like to do interactive work that is alive with sound and swapping animation," said Ben Rigby, CEO of Akimbo Design, a Web design firm in San Francisco. "In the past, this meant hand-coding of coordinates, lengthy animation pathways and JavaScript. Now, Dreamweaver does much of the redundant coding for us."

Steve Zehngut, president of Zeek Interactive, Inc., another San Francisco Web design firm, said he likes Dreamweaver because it is intuitive and doesn't require plug-ins.

Dreamweaver, page 54

Extranet brokers access to funds data

By Craig Stedman

THIS DATA IS my data, this data is your data. And to make life better for all of us, you might as well have direct Internet access to the stuff.

That is the song being sung by Charles Schwab & Co., which in July launched a Java-based extranet application that lets 150 mutual fund companies use the World Wide Web to download decision-support data collected by the San Francisco brokerage.

Analysts said Schwab is among the companies at the forefront of a move to link Internet and data warehousing technologies [CW, June 2]. The idea is to give analysis-minded external users, ranging from suppliers to customers, keys to online vaults of historical data.

Schwab initially tried to provide analysis capabilities to 10 mutual fund companies by installing a proprietary database at their sites that could be fed by Schwab systems. But that proved too expensive and cumbersome.

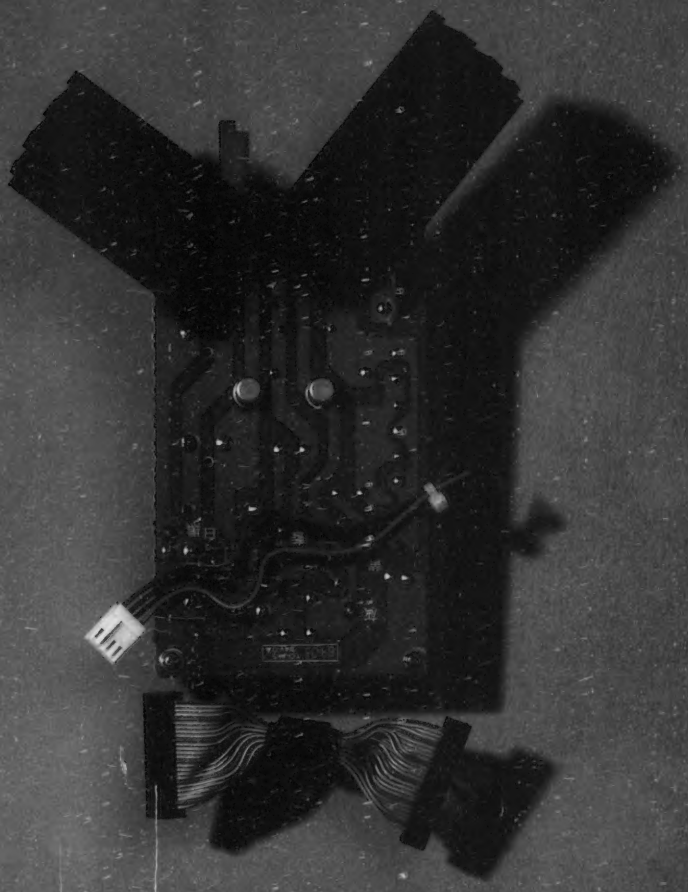
For Schwab, the extranet project was a way to avoid printing and mailing monthly reports on stock trading activity and asset holdings to mutual fund companies that use the brokerage as a sales channel.

But more important, Schwab hopes that providing the ability to customize reports and then directly download the information via the Web will help endear it to mutual-fund managers. The goal: Make it harder for rival discount fund brokerages to take business away from Schwab.

"The driving force for this was that the fund companies wanted to receive the information electronically," said Linda Coffey, a vice president in Schwab's fund relations department. "We want to be perceived as providing more services than our competitors, and we're trying to stay out ahead of the curve."

Schwab plans to make a

Schwab, page 54



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Component-based Development:

Opportunities and Challenges

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A Revolution in Application Development

By Stephen D. Hendrick
Director of the Application Development Tools program for International Data Corp.

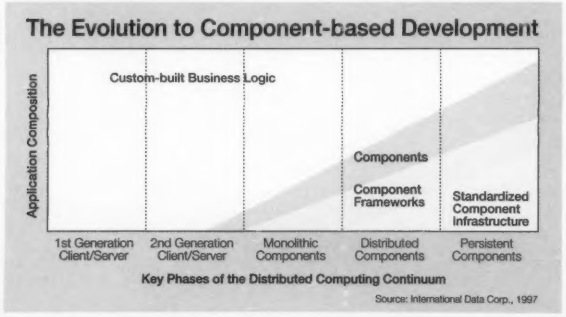
COMPONENT-BASED DEVELOPMENT (CBD) WILL REVOLUTIONIZE THE SOFTWARE INDUSTRY. Unlike recent trends such as objects and client/server, it is not just another flavor of distributed computing, but an extensible architecture to support a full lifecycle computing metaphor, including design, development and deployment.

Because of its high levels of reuse and interoperability, CBD will influence every dimension of application composition, including all types of clients, application servers and database servers, and will have a profound impact on all aspects of application development.

CBD's predecessor was object-oriented (OO) development. Objects were the industry's first stab at delivering high levels of reuse. But the unsophisticated nature of OO development environments and the lack of a common infrastructure for addressing object interoperability hindered their mainstream adoption. OO development was too far ahead of its time and lacked infrastructural support from the software industry.

CBD redefines objects in the context of a standardized infrastructure for interoperability, frameworks for the construction and assembly of applications, and pre-built components that subscribe to component infrastructures and frameworks. The infrastructural dimension of the component architecture is the catalyst to achieving the reuse and interoperability that undermined OO development. This infrastructure, along with the availability of CBD frameworks that enable component design, construction and assembly (rather than just being an environment for visual programming), will forever change how applications are developed.

Figure 1



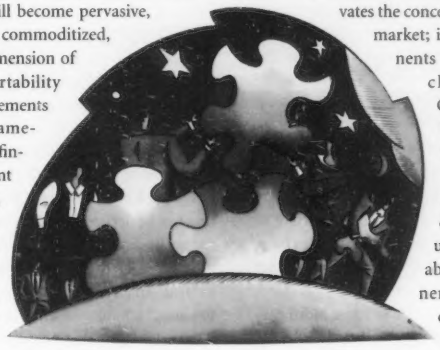
Three stages of CBD

Fig. 1 shows the evolution from first-generation (2-tier) and second-generation (3-tier) client/server to CBD. The dotted lines suggest the transitions between phases are evo-

ILLUSTRATIONS BY ©TIM LEWIS/LAUGHING STOCK

lutionary in nature. Because newer phases such as 3-tier client/server and CBD essentially subsume the functionality of older ones, the migration of systems is theoretically possible, although typically it is difficult due to the proprietary constructs of earlier products. As a result, many applications built with older products simply become another class of legacy system.

Fig. 1 (see preceding page) divides CBD into three stages: monolithic, distributed and persistent. Over time, certain standards will become pervasive, core services will become commoditized, and the infrastructural dimension of CBD will ensure that portability and interoperability requirements are met. Component frameworks play a key role in defining the design, development and deployment paradigm, usage metaphor, infrastructural extensions and pre-built components for application development. Frameworks, which work with the component infrastructure to provide a complete development environment, are the most important dimension of CBD.



The first stage of CBD is the era of monolithic components, a seeming oxymoron that describes the adolescent state of components today. None of today's component standards and frameworks have resolved the portability and interoperability issues that would allow components to be distributed or persistent across multiple vendor frameworks. Standards for CBD are being established but standardized infrastructural components do not exist. As a result, frameworks are being introduced with a high content level of proprietary infrastructural components.

In the next stage, monolithic components give way to distributed components as maturing component standards and new infrastructural components permit component interoperability and portability. Frameworks, now freed of specific infrastructural tasks, focus more on the development paradigm and support more aspects of the component lifecycle. The increased richness of component standards and frameworks brings support for more granular components, with many vendors marketing component libraries. In this stage, the scope of CBD expands to include component design. Component-based design changes the CBD paradigm from physical construction to logical design. The increased granularity of components, their rich and varied supply, and the inclusion of design metadata in the components themselves improves CBD and validates it as *the* application development paradigm.

The persistent component stage occurs when virtually all the infrastructure associated with CBD is commoditized. Commoditization encourages the growth of service providers who broker many types of components, which are easily customized by business rules. This elevates the concept of leasing in the software market; in this stage, most components are reused, leased or purchased by consumers. Component design is the focal point of CBD activities for those that manufacture components. Tool-centric issues (lifecycle coverage, development paradigm, usage metaphor and availability of pre-built components) become key product differentiators.

Now, application quality—measurable for the first time—becomes a competitive feature. Frameworks continue as the focal point for enabling application development due to their control over the development paradigm. Old functionality moves "down" and may even become part of the operating system. New functionality is divided into process functionality, which resides in the frameworks, and domain-specific functionality (along with domain content, which is embodied in component libraries). The persistent component phase is marked by cross-vendor interoperability without the requirement for specific bilateral technology relationships.

This distributed computing model, which relies on a synergistic relationship between component standards, infrastructure and frameworks, operates most efficiently when vendors collaborate on the core infrastructural dimensions of CBD. The faster this collaboration occurs, the faster CBD will mature. Such collaboration implies agreement on APIs, core languages, foundation classes and domain-specific metadata definitions. Once the infrastructure is agreed on, competition can revolve around factors such as features, quality and cost-to-use. This evolution to a standards-based infrastructure is accelerating as vendor attitudes about the basis for market competition mature (see sidebar, p. 9).

Challenges remain for CBD

For CBD to become the dominant paradigm for application development, three events must occur: the development of new enabling technologies, the availability of products that fully utilize these technologies, and the implementation of business models that allow full assimilation of the products and technology.

The first two events are already occurring. (The third is discussed in the sidebar on p. 9). The new enabling technologies include ActiveX, COM/DCOM, CORBA, Enterprise JavaBeans, Internet Inter-ORB Protocol (IIOP), JavaBeans, Java Virtual Machines (JVMs), message-oriented middleware (MOM) and Object Request Brokers (ORBs). Existing frameworks for CBD support many of these enabling technologies.

Applications developed today have more distributed properties than ever. These applications' distributed requirements currently can be supported only by tools that support 3-tier application development. Most vendors of such tools are re-engineering and/or repackaging them in the name of CBD. However, many of these tools rely on proprietary architectures, which constrains their ability to support reuse and interoperability.

As a result, some vendors are re-architecting their products to a higher level of abstraction, thereby extending their object models to support CBD. Although new products can avoid these massive re-engineering efforts, virtually all leading component standards are relatively immature, resulting in products that are either light on functionality or characterized by hybrid solutions with some proprietary content.

ActiveX, CORBA and JavaBeans may be the best known standards for CBD. However, vendors remain divided on support for them due to their differing focuses, philosophies and states of development. The API war for supremacy of the CBD standard is raging. With the outcome uncertain, some vendors conclude that the best course of action is to support all the standards.

Sybase Adaptive Component Architecture

The Adaptive Component Architecture (ACA) framework, which Sybase unveiled in April, represents both a unification of the company's products and an ongoing evolution of its product families in the direction of CBD. With ACA, the goal of Sybase is to deliver a framework that sets new standards for completeness, openness, flexibility and performance.

Completeness

ACA is one of the most complete and well-integrated collection of tools available for CBD. Fig. 2 (on the next page) shows the primary tools and interoperability components of the ACA framework. ACA provides unparalleled depth in development, middleware and data management tools.

Sybase has also achieved a balance between the synergy that can be derived from its tools used collaboratively and the utility derived from the use of one or more tools. This balance stems from Sybase's mission to build or provide best-of-breed tools for heterogeneous environments. Enabling technologies allow these tools to function as best-of-breed solutions in a multi-vendor environment while offering unmatched features across the application development domain when used collaboratively.

The ACA framework exhibits depth in several areas: the application development lifecycle, distributed computing solutions and application development paradigms. ACA addresses lifecycle requirements by delivering products that support application design, construction, deployment and maintenance. ACA's emphasis on CBD promotes better integration across these lifecycle stages through the development and use of components, which have inherent qualities of reuse and interoperability.

In the distributed computing domain, ACA supports all the leading models, including multi-tier client/server, CBD and the development of LAN-based as well as Internet-centric applications. ACA development tools also support multiple application development paradigms which are focused around design (PowerDesigner), construction (PowerBuilder, PowerJ, Power++ and PowerSite) and reverse engineering (PowerDesigner, PowerSite).

ACA is also close to achieving consistency in metadata management across all its tools. This solution, to be based on Universal Modeling Language, will subsume the ObjectCycle and MetaWorks solutions in place today. This unification of metadata will reduce complexity and will generate a standards-based solution.

Openness

The most visible aspect of Sybase's commitment to CBD is ACA's support for leading object and component standards. Tables 1 and 2 show how the company's development tools endorse the leading component standards (or models) from the perspective of Sybase being both a producer and consumer of components. Widespread production and consumption of components across the leading standards are important to ensure openness in the production (development) and consumption (deployment) of applications.

Table 1 indicates widespread support on behalf of Sybase application development tools for component production based on leading object and component standards. The depth of support for the leading standards across tools today and planned for 1998 is complete in the case of PowerBuilder and is appropriate for the rest of the tools, given their relatively short time in the marketplace.

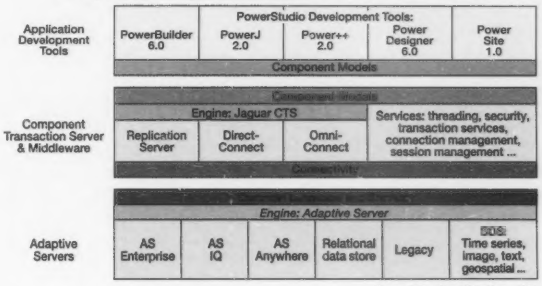
Table 2 defines the extent of component consumption by key ACA tools. The ability of a tool to consume components defines its utility, heterogeneity, openness and flexibility. The ability of key tools across the distributed computing domain to support Java is especially interesting. Sybase is pioneering support for Java across the three tiers associated with most distributed computing models: the client, application server and database server.

Pervasive support for Java across the distributed computing domain, especially the database, provides application developers with a compelling development environment due to its expanded power and elegant simplicity. Jaguar CTS is an important product within ACA due to its extensive support for the leading component models. This support provides Sybase with scalability for Internet and OLTP applications.

Because they offer comprehensive support for component models, the tools within ACA work as part of any heterogeneous environment or even more synergistically as part of a more homogeneous collaborative ACA-oriented environment.

Figure 2

CBD View of Sybase's Adaptive Component Architecture Framework



Source: International Data Corp., 1997

Flexibility

ACA provides unilateral development and deployment flexibility. This flexibility stems from component reuse and interoperability and is most evident to developers due to the ability to define discrete business components and distribute them across any type of device (ultra-thin, thin or fat clients, application servers or database servers). The open properties of Jaguar CTS and Adaptive Server, especially through their support for Java component model (an embedded JVM, Java classes and JDBC in the case of Adaptive Server), are instrumental in creating a compelling metaphor for distributing application logic.

Reuse and interoperability, while characteristics of CBD, are enhanced in ACA in two ways: through support for leading component models and the ACA application development paradigm. Reuse starts with classes but does not end there. To optimize reuse, the development paradigm must understand the multi-dimensional relationships between objects and their contextual semantics and relate this infor-

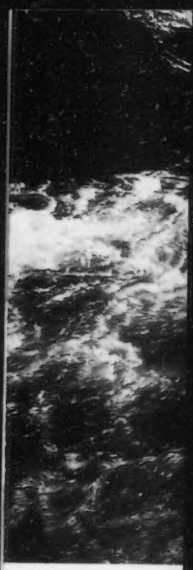
Table 1

ACA Component Production

Standard	Object/Component				
	PowerBuilder 6.0	PowerJ 2.0	Power++ 2.0	PowerDesigner 6.0	PowerSite 1.0
COM/DCOM (ActiveX)	Yes	Yes*	Yes	No	Yes
Java (Beans, EJB, applets)	1998	Yes	No	1998	No
CORBA	Yes	Yes	Yes	1998	No
C++	Yes	No	Yes	No	No
PowerBuilder Objects	Yes	No	No	Yes	No

*Java wrapper for ActiveX component

Source: International Data Corp., 1997



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Ten rules for selecting a CBD framework

The infrastructure for CBD is evolving. Buyers should look for frameworks with flexible architectures, which provide best-of-breed functionality and widespread support for the CBD infrastructure. Select frameworks that:

1 *Are built for openness.* Tools based on proprietary architectures have limited ability to leverage component frameworks and the wealth of standardized components and services that evolve. Don't confuse a tool's development paradigm—by definition, proprietary—with its architecture. Find tools that generate standardized components and assemble them into applications that use standardized services associated with CBD.

2 *Support multiple component standards.* Each component standard has its attributes. ActiveX reigns on the desktop. CORBA contends for the server. Most development tool vendors back JavaBeans. Find tools that support multiple standards; this promotes flexibility while offering insurance in case there are casualties in the API war.

3 *Promote easy reuse of components.* CBD tools need browsers with multi-dimensional object models for cataloging components, defining properties and maintaining relationships. This meta data intensive nature of CBD requires a repository for coordinating and managing this information.

4 *Address your portability requirements.* Component and application portability will grow in importance as the distributed computing wave creates new classes of devices and operating environments. However, the importance of portability varies and performance requirements sometimes outweigh the need for flexibility in porting.

5 *Promote extensibility* (a tool's ability to expand its scope and the scope of applications it produces with minimal constraints). Inheritance is a classic example of how to address extensibility, but more powerful object models (delegation) avoid the static limitations of the inheritance model. Know your application development requirements and assess the quality of fit and liabilities of architectural attributes of CBD tools under consideration.

6 *Promote design.* The development metaphor for most CBD relies on visual construction, but component generation and assembly based on logical design criteria is feasible. As component libraries expand, as components become more granular, and as design meta data becomes associated with components, design-based CBD will become a reality. A focus on design raises the framework's level of abstraction, leading to more re-use and productivity. Be aware of vendor products and initiatives in this evolving area of CBD.

7 *Are truly scalable.* Scalability continues to be a key determinant of a CBD tool's utility. Scalability defines a framework's ability to deploy applications of increasing complexity, which can support increasing numbers of users. The concept may be simple, but execution can be complicated, typically requiring a framework that can support multithreading, multiplexing, parallelism, failover, load balancing, other concurrency controls, instrumentation and system management interfaces.

8 *Support legacy and enterprise integration.* Components are unique in their ability to support many different environments. Since the component model provides for wrappering of legacy code, a CBD framework's ability to integrate legacy systems and how this function is performed can be critical in the tool selection process.

9 *Provide abstract development environments.* The concept of abstract development is an architectural issue related to openness, scalability and extensibility. A tool's usage metaphor is a proxy for its level of abstraction. Abstraction is driven by the richness of a tool's object model, and the extent to which class level support is provided. However, assessing a tool's level of abstraction and the utility it provides can be very complicated.

10 *Have design, development and deployment dimensionally.* Given the rapid evolution of distributed computing, the best way to maximize utility and minimize risk is to select frameworks that are unconstrained in their ability to adopt or adapt to new development paradigms, usage metaphors and other key trends in CBD.

mation to developers in a concise way that facilitates the design, development and deployment of components. The Powersoft family of tools neatly balances the abstracted development in modeling tools such as PowerDesigner with the rapid visual construction capabilities of PowerBuilder, PowerJ, Power++ and PowerSite.

When it comes to interoperability, ACA raises the bar in its support for server-side processing. While ACA supports component models across the entire distributed computing domain—most notably application servers such as Jaguar CTS and database servers such as Adaptive Server—ACA provides additional products and services that are related to interoperability.

ACA Component Consumption

Table 2

	Object/Component						
COM/DCOM (ActiveX)	Yes	Yes	Yes	No	Yes	Yes	Yes**
Java (Beans, EJB, applets)	Yes	Yes	No	No	Yes	Yes	Yes
CORBA	Yes	Yes	Yes	No	Yes	No	NA
C++	Yes	Yes	Yes	No	Yes	Yes	Yes
PowerBuilder Objects	Yes	Yes	Yes	Yes	Yes	Yes	1998

*Support through either a database stored procedure or database server component
**Through ODBC

Source: International Data Corp., 1997

OmniConnect, DirectConnect and the Common Language and Services component of the Adaptive Server architecture all address SQL-based RDBMS interoperability. As an option, the InfoHub component provides transparent dynamic SQL access to legacy data sources and supports access to leading non-relational databases and file systems. This component is a buffer that promotes transparency between the adaptive servers and all other data access components. The Common Language and Services component maps a common query language (Transact-SQL) to any Adaptive Server, thereby providing some degree of normalization across a diverse set of specialized database engines.

Replication Server adds flexibility to the ACA framework by providing asynchronous transaction-based replication capabilities. Replication Server supports heterogeneous requirements, which span distributed processing (data consolidation and decentralization), availability, analytical processing and disaster recovery. Its transaction-based orientation enables Replication Server to function as a key middleware component within ACA and, at the same time, places the product beyond the realm of conventional trigger-based solutions.

Performance

Sybase has gained performance in ACA through the concept of purpose-built tools and servers. This is particularly visible in the Adaptive Server data stores; since they are optimized for their specified task, they can deliver far higher levels of performance than general-purpose engines. Adaptive Server Anywhere and Adaptive Server IQ databases were built for addressing mobile computing

The third challenge: vendor "coopetition"

Although the software community has made progress in developing business models to support the CBD paradigm, challenges remain. The ongoing fragmentation in the software community results from the fact that there are many competitors, each operating with almost total autonomy—an autonomy that has impeded growth.

Vendor autonomy has prevented any real consistency in the message and products being delivered, forestalling critical mass in the market. From the buyer's standpoint, an inefficient market results, since it is clear that there is no consensus or unification of vendor strategies.

However, in the case of CBD, the vendor community recognizes the importance of unification and opportunity which results from collaborative competition, or "coopetition." But because this concept is new, vendors are being cautious. This is perhaps the greatest risk to CBD. Should vendors resist the notion of coopetition, the arrival of mainstream CBD may be significantly delayed.

and mass deployment, and data warehousing, respectively. Adaptive Server Enterprise, with its focus on OLTP and expanding support for specialty data stores, is gaining a reputation as the preferred database for supporting the complex, mission-critical development necessary for today's enterprise-class applications.

The collection of products and services that comprises ACA allows the development and deployment of any type of distributed application. This flexibility drives performance, because it enables ACA to implement an application optimized for its intended purpose and available system topology.

ACA is the only framework that has deep product-level support across the entire distributed computing domain. The completeness of ACA development tools ensures that changing application requirements and systems are easily supported through resident re-engineering and deployment features. As a result, ACA applications can evolve alongside changing business requirements with the same emphasis on productivity and performance.

Conclusion

The business justification for CBD virtually ensures that it will evolve to a point of mass market acceptance. Although issues regarding when and how CBD will come of age remain, most vendors, through their frameworks, will insulate developers from these questions. Accomplished vendors will also provide developers with frameworks exhibiting dimensions of completeness, openness, flexibility and performance. These versatile frameworks will mitigate the uncertainty and risk pertaining to how CBD infrastructure issues will be resolved.

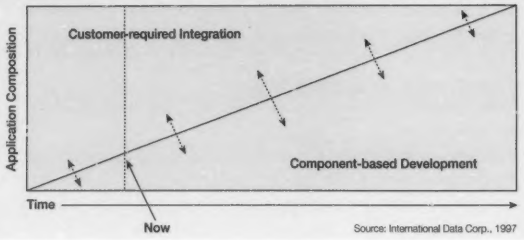
Adoption of a framework does not imply a homogeneous solution. In fact, since the focus of CBD is reuse and interoperability, CBD embraces the notion of heterogeneous solutions built from best-of-breed tools.

However, a case can be made for the added synergy, productivity and performance which comes from selecting a framework that embraces a common development paradigm. While ACA delivers a more compelling framework when its products are used collaboratively, the best-of-breed nature of ACA tools also secures their position as key products in heterogeneous solutions.

Fig. 3 shows that best-of-breed tools and frameworks can accelerate the adoption of CBD solutions. This event could cause the CBD "triangle" to increase in area, thereby reducing the integration required of the customer by conventional tools. This model suggests that developers should seek out tools and frameworks that rank high in completeness, openness, flexibility and performance and also qualify as best-of-breed.

Figure 3

The Evolution to CBD as Influenced by Best-of-Breed Tools/Frameworks



Source: International Data Corp., 1997

ACA rates as a best-of-breed framework for addressing CBD today, and shows strong signs, through its support for all leading standards, of maintaining this position for some time. The best-of-breed products that comprise ACA reinforce Sybase's leadership in CBD and ensure that, even when used individually, these products will continue to deliver high levels of performance. As a result, ACA ranks as perhaps the most compelling collection of frameworks, tools and products for addressing CBD today.

ABOUT THE AUTHOR:

Stephen D. Hendrick directs the Application Development Tools program at International Data Corp., a market research and consulting firm based in Framingham, Mass.

This program covers databases; 3GLs and 4GLs; analysis, modeling and design tools; software components; webmaster development tools; automated software quality; software configuration management; and other programmer development tools.

Mr. Hendrick is responsible for advising clients on market and technology directions as well as directing supply- and demand-side primary research on the market for application development tools.

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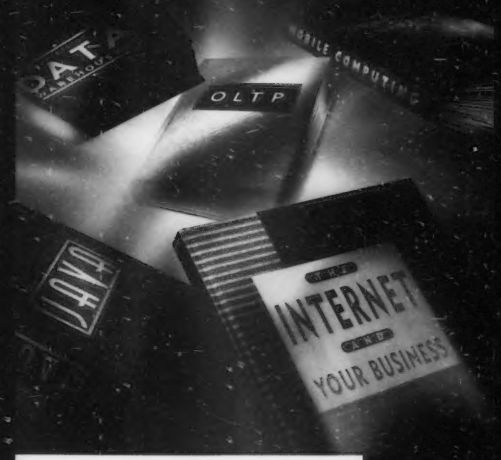

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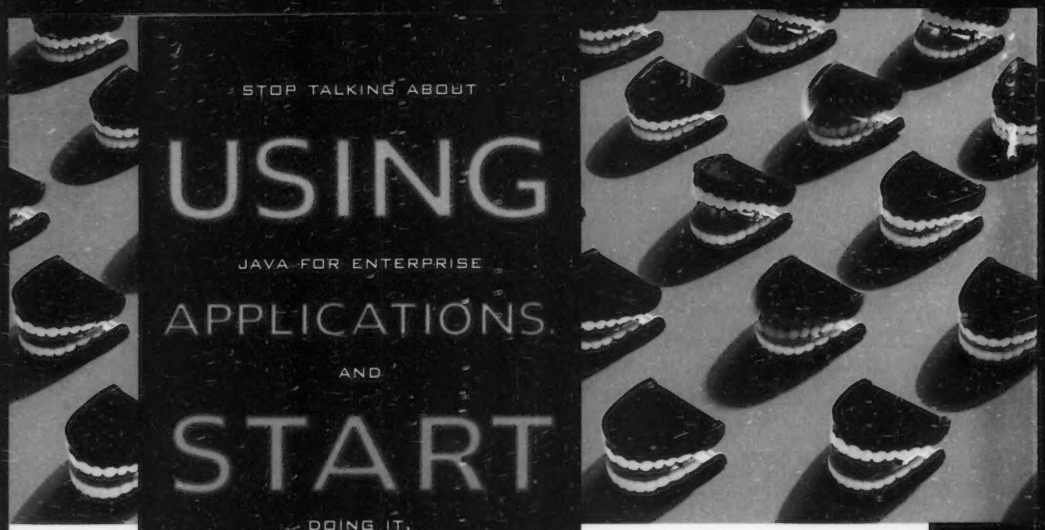

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WEB REVIEW▶
Investment sites

Schwab impresses

CONTINUED FROM PAGE 49

You can sign up for an account electronically, but you have to download an inconveniently large file to do it.

Schwab's most ambitious feature is Market Buzz, a financial information center on steroids. Buzz taps content from more than 80 sources of news, quotes, historical performance and financial planning resources.

Visitors can get only news headlines; you have to be a Schwab customer to get the full stories. For all its richness, Buzz is a little chaotic. Many information services are presented in frames, and the navigation schemes don't relate well to one another. In fact, some of the services appear to be earlier Schwab products that are framed and presented again under the Market Buzz banner.

A particularly clever idea is the interactive financial planning guides, which provide tutorial information for new investors and a clever college-saver calculator. Visitors come away with the impression that Schwab is a hip and innovative company, eager to provide them with lots of analytical tools. That's probably just the effect Schwab wanted.

HOW THEY STACK UP

	Charles Schwab	Merrill Lynch	Fidelity Investments	E-Trade Group
URL	www.schwab.com	www.merrilllynch.com	www.fidelity.com	www.etrade.com
FORMAT	Corporate Web site/ E-commerce	Corporate Web site	Corporate Web site/ E-commerce	Corporate Web site/ E-commerce
CORPORATE INFORMATION	Good	Very good	Poor	Fair
TIMELINESS	Excellent	Poor	Excellent	Fair
SCREEN USE	Good	Good	Good	Excellent
EASE OF NAVIGATION	Fair	Fair	Good	Excellent
SITE MAP	Yes	Yes	Yes	No
STYLE GRADE/ CONTENT GRADE	B/B	B/D	B-/A	A/C

MERRILL LYNCH

Quite the opposite of Schwab is the venerable Merrill Lynch. The New York-based company doesn't offer online trading and, judging by the lack of enthusiasm it brings to its site, doesn't particularly want to.

Whereas online brokers tempt prospects with data, Merrill Lynch doesn't even try. The home page offers three possible ways to get deeper into the site, which is confusing. Timely market information is almost nonexistent. Indexes don't even say if the market is up or down. Users can search for an individual stock quote, but features such as watch lists, trends, news or charts are apparently limited to customers only.

Merrill Lynch employs a variety of "centers" with guided tours to help with personal finance, investor learning and business planning. But the information is skimpy and lacks interactivity. Worse, each tour somehow leads to a Merrill Lynch offering and an accompanying marketing pitch. You don't get educated on this site — you get sold. First-time investors are also unlikely to relate to categories such as Asset Allocation, Equities are Performers and Building a Bond Ladder.

But the site has the greatest depth of corporate information of any of the sites reviewed — a volume of data designed to give the message that Merrill Lynch isn't for do-it-yourselfers but for investors who want access to smart people and are willing to pay to get it. The site offers the opinions of Merrill Lynch executives and discusses the firm's products and corporate activities in exhaustive detail. It also has the most consistent design of any of the sites sampled. But that is partly because the content is so static.

Contact information is skimpy, limited to a few main telephone numbers and a feedback electronic-mail box.

FIDELITY INVESTMENTS

Fidelity Investments in Boston is chasing Schwab in the online brokerage business, and its site reflects a very similar marketing approach to its West Coast competitor. There is a ton of information here. But like the Schwab site, Fidelity.com is a bit of a patchwork, lacking a clear set of design standards.

The site is anchored by two sections called Personal Investing and My Market. Each offers a lot of content, but some of it overlaps, and the look and feel is inconsistent between the two. My Market uses an elegant black frame to box its multitude of information services, but it puts a few too many buttons on the navigation bar. Full-text news is free — a big plus. You can create a customized home page ticker with quotes and news, but my ticker repeatedly returned an unexplained JavaScript runtime error.

Personal Investing is a less well-designed service that frontends Fidelity's awesome mutual fund service. Features such as news, quotes and market indexes are the same as those offered on My Market, but it is harder to figure out how to get a stock quote here. Design standards are erratic. There are 13 navigation buttons in some spots. Fidelity is the only site reviewed that uses audio service — a daily market update — but it is a minor feature of the site.

Not surprisingly for the world's mutual fund leader, the online funds information is outstanding. Information about Fidelity funds is exhaustive, and a spiffy Java applet, Funds Evaluator, uses Morningstar, Inc. data to give interactive analyses and rankings of every fund Fidelity sells. Fidelity has to be strong in mutual funds data, and it doesn't disappoint.

Corporate information is almost nonexistent, and links to international offices are skimpy.

E-TRADE

Schwab's online nemesis has been spunky E-Trade Group, Inc., a 2-year-old virtual trading firm in Palo Alto, Calif., that already claims more than 200,000 customers. Growth is clearly paramount to the young company, so much so that nearly everything about its home page is aimed at getting you to sign up. And the online sign-up feature, which lets you fill out and then print a Hypertext Markup Language form, is the easiest to use of any of the brokers reviewed.

In contrast to Schwab and Fidelity, E-Trade doesn't give away much information for free. The home page entices visitors with teases for information treasures that await behind the membership door, but the clear message is that for $20 per trade, E-Trade isn't going to give this stuff away. You can't buy mutual funds on E-Trade, but the home page doesn't exactly advertise that fact.

As a corporate billboard, E-Trade is exceptionally coherent and well-planned. Its pages feature a uniform design with navigation bars on the top and bottom and no pages occupying more than two screens. The three-dimensional buttons are consistent from page to page, and the Home button is always easy to find. No matter where you are, you always know you are in E-Trade.

The most innovative feature on E-Trade's site is a stock market game. Contestants use dummy accounts and play money to compete with one another, with the monthly winners getting a nominal prize. The game is actually the best way to get a look at expanded E-Trade services, such as multiple quotes, watch lists and company research. But E-Trade doesn't tell you that. Some of the more useful research features are available free to game players, but you have to go looking for them.□

SHORTS

Intranet groupware

Changepoint International Corp., a subsidiary of Richmond Hill, Ontario-based Changepoint Corp., next month will ship Involv Intranet 2.0, an upgrade of its software for hosting groupware applications on intranets. The new version lets users access nine starter applications and create their own password-protected, virtual meeting room. Pricing is $40 per user in quantities of 1,000 or more.

Netscape aims at telcos

Netscape Communications Corp. will offer a new edition of its server software, SuiteSpot Hosting Edition, for telecommunications companies and large corporate partners to offer hosted Internet, intranet and extranet services. Plugging in to the local telecommunications company, businesses and individuals could gain access to a variety of services, including World Wide Web document publishing, messaging, group discussions and directories. Netscape is licensing the software at $13 per seat for individuals and $39 per seat for corporate intranets.

E-document security

IBM officials said the company is preparing to ship a new version of its Cryptolope document-sharing software.

The software lets users wrap documents and multimedia files in a software "envelope" that includes code to require users to pay to view the document or executable code to make the document part of a workflow process. The new version, written in Java, allows documents to be shared using Cryptolope in any electronic format. IBM expects to ship the software next month. Pricing hasn't been determined.

MMX
intel inside
pentium II

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Dreamweaver first to support dynamic HTML

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And Zehngut said he appreciates not having to write for separate browsers. "It tells you up front where functions will work and where they won't, so you don't have to backpedal," he said.

But Peter Dushkin, an analyst at Jupiter Communications, Inc. in New York, warned that Dreamweaver may lose much of its appeal as a cross-browser dynamic HTML editor if the World Wide Web Consortium arrives at a dynamic HTML standard in the coming months. "It's sexy now because it's one of the first products to bridge competing standards in the 4.0 browsers from Microsoft Corp. and Netscape Communications Corp.," Dushkin said.

Dreamweaver does, however, have other strong features that make it worthwhile, Dushkin said. "The program provides charts depicting the different platforms hitting your site, and these are helpful, because they let you know which platforms you should optimize for."

An animation time line, a layers palette, the ability to manage sitewide changes and a library of JavaScript behaviors such as "mouse rollovers" or "play sound" also are included.

Todd Fullerton, a computer graphics analyst at Toyota Motor Credit Corp. in Torrance, Calif., said he plans to use Dreamweaver to bring interactivity to his group's Web-based training programs. "If Dreamweaver helps us to create a bit of movement on the page and this helps to captivate users, we'll be more successful at getting our message out," he said. □

Schwab hands out keys to its data

CONTINUED FROM PAGE 49

wider range of data available in a more timely manner, Coffey said. For example, more detailed reports could be created for customers who manage specific types of funds, such as retirement plans. Eventually, Schwab wants to update the data on a real-time basis, she said.

For Jim Robillard, chief investment relations liaison at Baron Capital, Inc.'s Baron Funds in New York, Schwab's extranet is cutting two to three weeks off the time it took to plow through the monthly printed reports and manually enter data into an Excel spreadsheet.

"It's a tremendous amount of material, and in paper form it was unsortable," Robillard said. "There was no automation at all." And because the reports usually didn't arrive until nearly two weeks into the next month, the analysis that finally got done "was a little retrospective," he added.

Opening up historical data to outsiders "is all the rage out there right now," said Ed Schaide, an analyst at The Standish Group International, Inc. in Dennis, Mass. But the big challenge is to make sure that individual users can see only information about themselves, he said.

Schwab built the application around a Java-based data analysis server made by Infospace, Inc. in San Mateo, Calif. Users point their Web browsers at a uniform resource locator that lets them log on to Infospace's SpaceSQL software, which dynamically builds reports from information stored in an Oracle Corp. database.

Users then can download reports directly into Excel spreadsheets, said Dan Keller, senior vice president of Schwab's mutual funds technology group. To keep data from falling into the wrong hands, the SpaceSQL server is located behind Schwab's firewall and holds a database of passwords and IDs for each user. Keller wouldn't say how much Schwab has spent on the project. □

NEW PRODUCTS

TENDRIL SOFTWARE, INC. has announced Structure Builder 1.0 for Java, a tool for object design that transparently updates Java source code.

According to officials at the Westford, Mass., company, the tool displays a side-by-side view of the object design and the source code. It automatically generates code in sync with object design changes and modifies object design with code changes. Structure Builder helps programmers visualize development and interact with overall design rather than focus on rote programming tasks.

Structure Builder 1.0 costs $495.

Tendril Software
(508) 392-9600
www.tendril.com

WATCHSOFT, INC. has announced Disk Tracy, Internet monitoring software for corporate computer networks.

According to the Houston company, the software has a uniform resource locator tracking system that keeps a log of sites visited by users, with date and time stamps. Detailed reports can be generated about World Wide Web sites visited and about material downloaded. The program works in Windows and Unix environments.

Pricing is about $1,150 for systems of up to 25 nodes.

Watchsoft
(281) 586-2036
www.watchsoft.com

ELEKTROSON, INC. has announced WebGrabber 2.2, software that saves World Wide Web content to a CD for archival and presentation purposes or off-line browsing.

According to the Campbell, Calif., company, the software enables users to record a Web site's Hypertext Markup Language, applets, graphics, audio and text files to CD. Once recorded, it can be played back from any CD-ROM drive as it would appear on the Internet. The Windows-based application supports all recorders, according to the company.

WebGrabber costs $79.95.

Elektroson
(408) 371-4800
www.elektroson.com

ALADDIN SYSTEMS, INC. has announced Private File, cross-platform encryption software for transmitting files over the Internet.

According to the Watsonville, Calif., company, the software uses 128-bit encryption in two applications: PF Encrypt and PF Decrypt. To encrypt and compress, users drop files onto the PF Encrypt application and enter a password. To access a transmitted file, the recipient drops the encrypted document onto PF Decrypt and enters the password at the prompt. Private File works with Windows 95, Windows NT 4.0 and Mac OS 7.0.

It costs $99.95 for a two-user license.

Aladdin Systems
(408) 761-6200
www.aladdinsys.com

GOLIVE SYSTEMS, INC. has announced CyberStudio 2.0, Macintosh-based software for World Wide Web site design and management.

According to the Menlo Park, Calif., company, the software doesn't require any Hypertext Markup Language (HTML) programming but includes HTML source code and JavaScript tools if needed.

The new version's layout mode supports ActiveX controllers for Microsoft Corp.'s Internet Explorer.

CyberStudio 2.0 can check and repair broken links within Web pages. A spell-checker and the ability to link information from several independent servers are included.

CyberStudio 2.0 costs $349.

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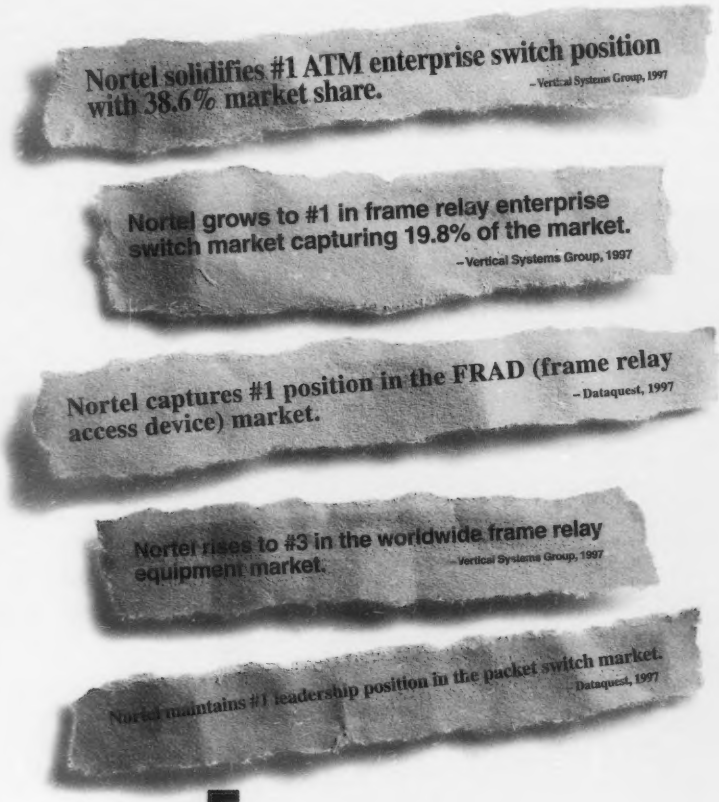

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The Enterprise Network

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Briefs

Managing bandwidth

Ukiah Software, Inc. in Campbell, Calif., this week will begin beta-testing TrafficWare, bandwidth control software for IP or IPX networks that runs on a Windows NT system. Like Ukiah's firewalls, TrafficWare builds on user groups already defined in available directories to simplify creation of management policies and lets users allocate bandwidth by user or application. Ukiah supports Novell, Inc. directory services and Lightweight Directory Access Protocol 3.0-compliant systems. It is expected to ship in December.

CompuWare tries NT

CompuWare Corp. in Farmington Hills, Mich., is beta-testing a version of its EcoTools system and application performance monitor that runs entirely on a Windows NT system.

The simpler NT interface lets managers track hundreds of NT, Unix and other platforms. Version 5.0 stores data in Microsoft Corp.'s SQL Server, instead of the former proprietary database, for easier exporting and reporting. It should ship by the end of the year.

Network management duties

Rank the importance of tasks involved in managing networks (1 = unimportant to 5 = critical)

→ Availability	4.73
→ Performance	4.31
→ Faults	4.22
→ Security	4.15
→ Improving performance management	3.90
→ Configuration change	3.79

Base: 200 IS managers, engineers and consultants

Source: International Network Services, Inc., Sunnyvale, Calif.

Outsourcing lets IS pick targets

▸ *External specialists optimize net management*

By Patrick Dryden

SELECTIVE OUTSOURCING of network management tasks is on the rise, according to research by The Yankee Group in Boston.

Although some users happily unload all network duties on integrators or full-service outsourcers, most Fortune 1,000 organizations are reluctant to hand over all the keys to their strategic network, said Yankee analyst Kitty Weldon.

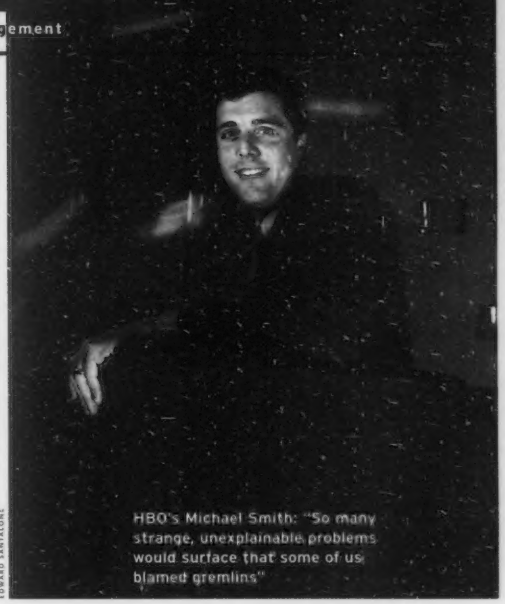
"Even large shops find it hard to do everything internally," Weldon said.

Yankee's survey of information systems directors at 25 large corporations revealed an increasing desire to hand off tactical tasks such as diagnostics, performance tuning and Internet/intranet maintenance.

IS managers told *Computerworld* that they can better serve internal users and external customers by supplementing their staff with a specialty service.

"We prefer to keep close con-

IS hands off, page 58



EDWARD SANTALONE

HBO's Michael Smith: "So many strange, unexplainable problems would surface that some of us blamed gremlins"

Sun has 'net mail server on tap

By Barb Cole-Gomolski

SUN MICROSYSTEMS, INC. hopes to fill a void for companies that want the scalability of Internet mail and the features associated with proprietary electronic-mail systems.

The company recently introduced Sun Internet Mail Server 3.1, a messaging server based on Internet mail standards that has an integrated Lightweight Directory Access Protocol directory. Sun officials said the software can support thousands of users per server, compared with client/server systems that typically support only a few hundred users per server.

The cost of ownership of E-mail systems drops as they scale to support more users because high-volume systems require companies to buy and administer fewer servers.

Although Sun hopes to steal business from well-entrenched messaging vendors such as Lotus Development Corp.,

Sun, page 58

Open messaging means savings

- Companies can **save $367 to $406 per user** in the first year using standards-based E-mail
- Average E-mail administrator **can support 1,300 users on a standards-based messaging system, compared with about 740 users** on a proprietary system
- It costs about **$174 per year** to provide a user with standards-based E-mail, compared with about **$541 for a proprietary system**

Source: Creative Networks, Inc., Palo Alto, Calif.

Networking in Europe a bumpy ride

By Bob Wallace

INCONSISTENT regulations, huge line installation delays, high prices and inconsistent support give fits to information systems managers extending their networks to Europe.

Until they encounter the complexities of dealing with myriad European governments and carriers, U.S. companies take for granted the sophisticated wide-area network choices they have in the U.S., analysts said.

DEREGULATION IN EUROPE

Although the European Union has agreed to deregulate telecommunications in Europe, only a handful of countries have opened up their telecommunications industries to full competition, and others don't plan to, according to Dave Neal, an analyst at Gartner Group, Inc. in Stamford, Conn.

"Users must realize that in Europe, they're dealing with over 12 countries, each with their own rules and agenda,"

European networking, page 58

Novell defends its turf against NT

▸ *Offerings to compete with Microsoft*

By Laura DiDio

NOVELL, INC. HOPES its next-generation IntranetWare and advanced clustering software will be the one-two combination that staves off defections to the rival Microsoft Corp. Windows NT Server platform.

Novell is set to begin shipping a beta version of IntranetWare, code-named Moab, in November. Additionally, the Provo, Utah-based company announced plans to ship a beta copy of an optional clustering package, code-named Orion, early next year.

The combination has the potential to outpace Windows NT in directory services, clustering and intranet functionality, analysts and users said.

"The management capabilities included in Orion are a generation ahead of those defined in Microsoft's upcoming Cluster Server product [formerly

Novell, page 58

IS hands off some tasks

CONTINUED FROM PAGE 57

trol of our network, but it's tough to find someone who understands all the management statistics and can explain the implication on quality of service," said Mike Del Secolo, senior director of communications engineering at ADP Corp. in Roseland, N.J.

The payroll processor hired International Network Services, Inc. in Sunnyvale, Calif., to analyze the performance of its wide-area network, summarize the most important details about hundreds of internetworking devices and project bandwidth trends.

"This keeps my head count down while providing valuable information to our troubleshooters and capacity planners," Del Secolo said. Now network engineers can spend more time working on strategic projects instead of deciphering minute details, he said.

Network details also bedeviled IS at the Home Box Office division of Time-Warner Entertainment Co.

"So many strange, unexplainable problems would surface that some of us blamed gremlins," said Michael Smith, director of network strategy at HBO in New York.

NO MORE SURPRISES

With daily surprises disrupting planned work, Smith's team sought a way to end the reactive firefighting mode of operation. It tested a fault-prediction service from NetOps Corp. in New Fairfield, Conn., to complement its normal network management tools.

"Our alerting systems tell us when something fails, but it's better to get ahead of the game by tackling issues before they affect critical applications," said Gargan Yee, a senior network engineer at HBO.

For example, NetOps detected errors made by a switch that indicated its processor card would soon die, and it correlated several traffic errors to reveal a protocol-handling problem by a router, Yee said.

"Prior to NetOps, we didn't even know we had symptoms," Smith said. NetOps can analyze a 2,000-node network for about half the cost of a full-time employee, he said.

Seeking a similar benefit in security, Computer Discount Warehouse, Inc. hired NetSolve, Inc. in Austin, Texas, to monitor its Internet connections and World Wide Web presence full time.

"We want a stable Web site for our customers, and we need to guard against hacking attempts, E-mail hijacking and virus attacks around the clock," said Steve Staines, network administrator at the reseller in Vernon Hills, Ill.

During the past year, NetSolve operators have alerted Staines each time his Internet service has faltered, and they have detected break-in attempts every month, he said.

"We were skeptical about security monitoring at first, but now we absolutely don't want to do without it," Staines said. "We could lose more revenue from a few hours of downtime than the service costs." □

EDWARD SANTALONE

HBO's Gargan Yee says, "It's better to get ahead of the game by tackling issues before they affect critical applica-

Sun Internet mail server

CONTINUED FROM PAGE 57

Microsoft Corp. and Novell, Inc., it is also pitching its mail server as a backbone that can coexist with — and increase the scalability of — multiple client/server E-mail systems.

"I like that idea," said Jeff Franks, a senior technical specialist at a Midwest retailer that runs Novell GroupWise enterprisewide. "GroupWise works great as long as you are running in the NetWare environment," Franks said. "But when you mix in Windows NT and Unix, it is more of a mixed bag in terms of scalability."

NOT A REPLACEMENT

Franks said he doesn't view Sun's offering as a replacement for GroupWise, even though Sun plans to add calendaring support, workflow and gateways to other mail systems down the road.

Rather, Sun's mail server could be used to off-load traffic from the GroupWise system, thus improving performance and reliability, Franks said.

The Sun Internet Mail Server can run in conjunction with any mail client that supports either Post Office Protocol or Internet Message Access Protocol.

Several users beta-testing the product said they were impressed by its scalability.

"There aren't many products that can handle this kind of volume," said Greg Thomas, chief technology officer at Northwest Regional Education Service District in Hillsboro, Ore., a service bureau that provides Internet access, E-mail and other computer services to schools.

E-MAIL FOR STUDENTS

The service bureau will use Sun's mail server to provide about 100,000 schoolchildren with E-mail accounts.

Thomas said he expects to support about 5,500 users per server, compared with about 1,500 per server he could support with GroupWise, Microsoft Exchange or Lotus CC:Mail. Thomas said he also found that Sun's server is more adept at handling Internet attachments than those other products, which require gateways or message transfer agents to send Internet mail.

Available now, Sun Internet Mail Server 3.1 runs on Intel Corp. Solaris and SPARC systems. Pricing is $1,495 for the departmental versions and $3,495 for the enterprise version, which supports multithreading and has gateways to other E-mail systems. □

European networking

CONTINUED FROM PAGE 57

Neal said. "That makes it extremely difficult to build a pan-European network."

Long turnaround times for private lines and high prices have kept Guardian Industries, Inc., an auto parts manufacturer with plants in 13 countries, on an analog dial-up modem network.

"We'd love to use private lines to support collaboration using Lotus Notes, but private lines cost a fortune — $7,500 for 56K bit/sec. frame-relay links that would cost around $1,000 in the U.S.," said Ken Nixon, network manager at Auburn Hills, Mich.-based Guardian.

HIGHER COSTS

Users can expect to spend 10 to 12 times more for services in Europe, Neal said.

And some services, such as 45M bit/sec. T3, aren't widely available in Europe. In fact, some less-advanced countries don't have the network infrastructure to support medium-speed services, Nixon said.

Guardian would like to run its 9.6K bit/sec. dial-up network throughout Europe. But some networks support only 2.4K bit/sec. dial-up speeds.

Service and support is another sore spot for users who have networks in Europe.

"We have a frame-relay network in Europe, but the service and support from our carrier was so poor that we started looking at another carrier with more of a presence in Europe," said Natalie Johnson, a member of the communications networking services group for Benton Dickinson Immunocytometry Systems, Inc. in San Jose, Calif., which makes sports medicine products. □

Novell

CONTINUED FROM PAGE 57

Wolfpack 1.0]," said Jay Bretzmann, vice president of worldwide systems research at International Data Corp. in Framingham, Mass.

"With its new virtual memory and memory protection, Moab erases Novell's most glaring deficiencies as an application server," said Bob Sakakeeny an analyst at Aberdeen Group, Inc. in Boston.

Moab, now slated for delivery in mid-1998, will be the first version of the operating system to run natively on TCP/IP.

Moab will improve as an application server with support for Java applications, Common Object Request Broker Architecture/Internet Interorb Protocol and ActiveX — all in conjunction with Novell Directory Services.

SCALABLE STORAGE

Orion, advanced clustering technology that also is due in the second half of next year, will improve NetWare's application serving abilities by allowing as many as 16 network servers to work together with scalable storage systems.

Robert Abate, chief information officer at GTN Technologies LLC in Lawrenceville, N.J., said Novell is going in the right direction with open systems.

Dean Johnson, senior technical specialist at Freudenberg-NOK General Partnership, an auto parts manufacturer in Bristol, N.H., agreed.

"Are we worried about Novell's ongoing business problems? Yes. But the fact that we're staying our course and upgrading to IntranetWare is the best vote of confidence for [Novell CEO Eric] Schmidt and the new technologies," Johnson said. □

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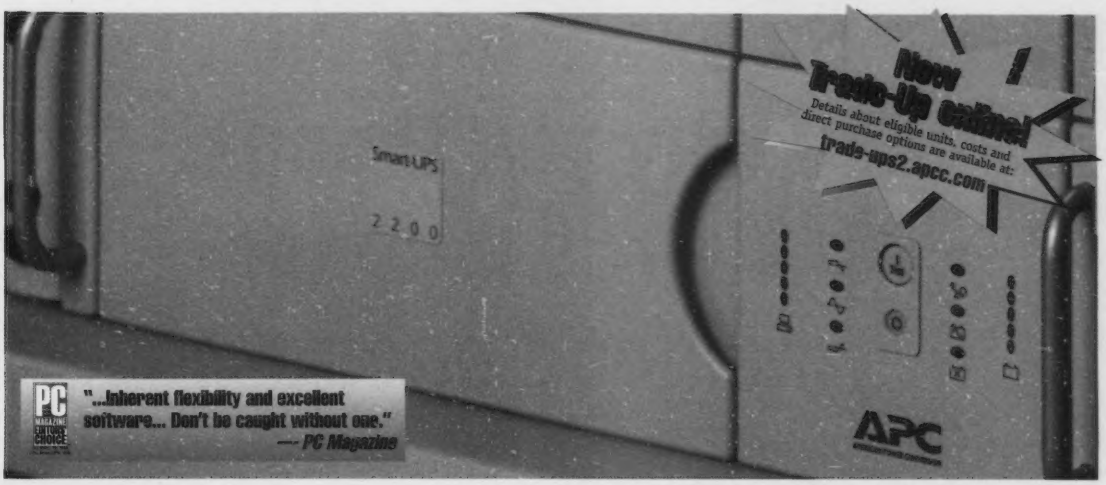

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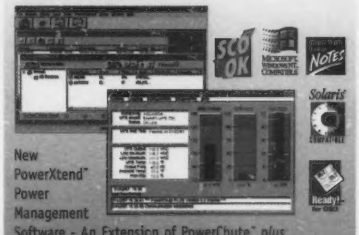

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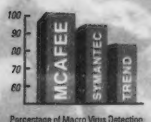

Percentage of Macro Virus Detection
Source: *Virus Bulletin*

Let's talk percentages. If your anti-virus package delivers 94% detection, there's still a 6% chance you'll be totally screwed. And when that happens, there's exactly a 0% chance the CEO will understand. Fortunately, there's McAfee, the anti-virus defense with 100% protection.

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Software

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Briefs

Web management

Saratoga Systems, Inc. in Campbell, Calif., this week shipped Avenue, a 32-bit Web-enabled customer management system for Windows 95 and Windows NT. The system has a built-in World Wide Web browser that tightly integrates the sales force automation system with corporate intranets and the Internet. Avenue costs $25,000 for 15 users and is available at volume discounts.

Mainframe mining

IBM plans a consulting service that will help users mine all the gold in their mainframe data. Called the Treasure Series, the service brings consultants into medium-size companies to analyze S/390 mainframe data and reveal market trends and customer buying patterns.

Middleware reseller

IBM will let Candle Corp. resell its MQSeries middleware package worldwide, the first worldwide reseller agreement Big Blue has signed. Other similar software deals will come, IBM officials said. Candle in Santa Monica, Calif., makes several tools to manage MQSeries installations.

Domino product

Lotus Development Corp. in Cambridge, Mass., has shipped NotesPump 2.5, an upgrade of its server software used to import data into Domino servers. The new version supports real-time data access to dozens of databases. The tool costs $7,995.

Managing knowledge

Dataware Technologies, Inc. in Cambridge, Mass., this week will announce Dataware II Knowledge Management Suite, software designed to let users capture, manage and share a company's intellectual property. The software integrates information stored in desktop applications, Hypertext Markup Language, groupware and databases. It will be available in the fourth quarter.

CEO pushes migration onto fast track

▸ *Peregrine updates software to compete*

By Thomas Hoffman

TALK ABOUT top-down project management.

Three months into a massive information technology consolidation project, Peregrine, Inc.'s operations staff told Ed Gulda — the company's chairman — it would take at least six weeks to migrate personnel records onto a hybrid Unix/Windows NT platform.

Big mistake.

Unwilling to accept such a delay, Gulda instructed each of Peregrine's 700 salaried employees to load their own personnel records into the system instead of leaving that work for data entry clerks to handle.

The result: Gulda's directive reduced the effort from six weeks to two and a half weeks.

"It came down to people taking charge of this themselves and not waiting for the technical people to spoon-feed them," Gulda said.

Gulda's hands-on management of the IT project was evident throughout. In January, Gulda and a group of auto industry executives formed Southfield, Mich.-based Peregrine from four underperforming units they purchased from General Motors Corp.'s Delphi unit.

"I held our people accountable for getting this thing in."
– Ed Gulda, Peregrine CEO

To ensure the success of the new company, Gulda personally spearheaded a $20 million rapid IT deployment project that required migrating 500-plus legacy applications to seven core systems that support manufacturing, financials and other functions in less than five months.

The GM systems Peregrine inherited comprised a mix of mainframe, midrange and Unix legacy systems that supported everything from manufacturing to human resources.

Peregrine, which makes auto components such as interior door panels, "was founded on the basis of speed and preci-

Migration, page 62

Baan, HP offer users out-of-box middleware

By Randy Weston

THE BAAN CO. is the latest vendor to offer users a take-out version of client/server enterprise systems.

The Dutch vendor, with U.S. headquarters in Menlo Park, Calif., has hooked up with Hewlett-Packard Co. to offer users a ready-to-go package of software, hardware, database, middleware, training programs and implementation services. The software system is used to automate business processes from order-entry systems to general accounting applications.

Baan officials said prices for the offering, available this month in the U.S., will start at between $500,000 and $1 million. It is targeted at companies that range in size from $50 million to $500 million in annual revenue.

"The positive side of this is if you are getting a bundled product like Baan that is quite scal-

Middleware, page 62

Baan/HP application package for small and medium-size companies

- HP 9000 Enterprise Server running Unix or HP NetServer Systems running Windows NT
- Baan IV enterprise applications
- Informix, Oracle or SQL Server databases
- Integrated HP systems such as HP OpenView and HP Omniback II
- Design, configuration and performance audit services
- HP and Baan support services

Microsoft object spec opens up to Unix users

▸ *Ports move DCOM beyond Windows*

By Sharon Gaudin

COMPANIES MAY soon be able to access legacy data on Unix and mainframe systems with the same technology used on Windows desktops.

Software AG, Inc. is in the midst of porting Microsoft Corp.'s Distributed Component Object Model (DCOM) architecture to non-Windows platforms, opening up the long-proprietary application development technology to mainframes and Unix machines.

Software AG, a German company with U.S. offices in Reston, Va., came out with DCOM for Sun Microsystems, Inc.'s Solaris operating system late last month, and a list of others is on the way.

SLOWDOWN

The move may create a bump in the road for the mounting momentum for the CORBA/Java combination that users have been picking up to access database information on disparate databases. Before Common Object Request Broker Architecture (CORBA) and DCOM for systems other than Windows came along, connecting to that database information was as tricky as wiring a telephone system with string and cans.

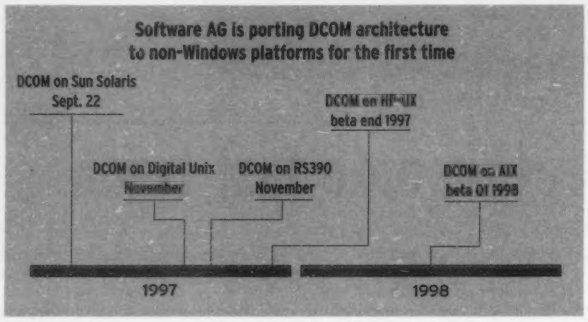
"We needed to get historical data, like quotes, off our Solaris system for our traders who are using Windows desktops.

Many companies may still choose a combination of CORBA and Java to move information over the 'net.

DCOM did the job," said Joe Persichetti, senior software engineer at Dow Jones & Co. in Princeton, N.J. "It's great for anybody interested in supporting legacy applications. And we already knew [Component Object Model] and DCOM, so we didn't have to learn something new like CORBA."

Software AG is scheduled to move DCOM to several other platforms in the coming

DCOM, page 62



DCOM gets ported to Unix

CONTINUED FROM PAGE 61

months. The following ports are on tap:

- Digital Equipment Corp.'s Digital Unix is slated for general availability next month.
- The OS/390 IBM mainframe operating system is slated for release at the end of next month.
- Hewlett-Packard Co.'s HP-UX is set to go beta by year's end.
- IBM's AIX is set for beta in the first quarter of next year.

FLEXIBILITY

DCOM and CORBA can be considered electronic buses that transport information among applications on clients and servers. CORBA, an industry-standard architecture overseen by the Object Management Group in Framingham, Mass., can transport information among any clients and servers, whether they are Windows, terminals or network computer front ends. The new, more open DCOM will be able to move between the various servers and a Windows client.

Tim Sloan, an Internet analyst at Aberdeen Group, Inc. in Boston, said a nonproprietary2 DCOM could be a good application development answer for companies that have Windows on the desktop. But Sloan said many companies may still choose to use a combination of CORBA and Java to move information over the Internet.

"Why people would use [DCOM] instead of CORBA beats the hell out of me," Sloan said. "CORBA is already being deployed in Fortune 200 companies. It works today on Windows, Unix and mainframes. DCOM is great if you're only going to move information to Windows." □

Migration on fast track

CONTINUED FROM PAGE 61

sion," requiring "real-time information" distributed among its four manufacturing plants, Gulda said.

Gulda oversaw similar IT projects at three previous companies he helped run, including Lucas Varity Kelsey Hayes, a Livonia, Mich.-based auto parts supplier.

Speed is key in the automotive industry, where suppliers are judged on their responsiveness to the Big Three in Detroit and other automakers with U.S. operations, such as Nissan Motor Co. and Daimler-Benz AG.

The Big Three — Ford Motor Co., GM and Chrysler Corp. — "are demanding suppliers bring their costs down every year," thereby forcing suppliers to streamline their operations and react faster to supply-chain demands, said Gisela Wilson, director of research at Advanced Manufacturing Research in Boston.

Peregrine's business model is considerably less centralized than GM's. For example, electronic data interchange (EDI) functions for the Delphi units were managed centrally at GM. EDI transaction sets would then be sent out to each of the four plants in the U.S. and Canada.

Plus, the 510 systems that Peregrine inherited from GM were poorly integrated. All of those systems were scrapped with the exception of a few employee attendance subroutines.

At Peregrine, Gulda wanted EDI to be decentralized and managed by each of the four groups, using a common approach to smooth the way for upcoming acquisitions or any divestitures the company might make. With $1.2 billion in annual sales, Gulda said he hopes to get Peregrine to the $3 billion mark by 2000, primarily through acquisitions.

To install new systems quickly, Peregrine hired Electronic Data Systems Corp. and its A. T. Kearney consulting unit. A. T. Kearney built a "model office" to test performance of the manufacturing application chosen from QAD, Inc. in Carpinteria, Calif., and tailored the software for Peregrine's needs, said Dan Oxyer, a principal at A. T. Kearney in Southfield, Mich.

ATM NETWORK

The model office helped A. T. Kearney link the QAD software with Peregrine's PeopleSoft, Inc. and other applications. A. T. Kearney's 130-person staff replaced Peregrine's coaxial text-based terminal environment with a fiber-optic Asynchronous Transfer Mode network using Hewlett-Packard Co. server hardware and Unix and Windows NT operating systems, said Thomas J. Morgan, Peregrine's IT director.

Gulda couldn't quantify the business benefits of the new IT environment, which was fully installed by its June 30 deadline. "I never try to quantify such things, but the real-time impact it has had is that we operate decisively and quickly and are very responsive. We couldn't do that before" under the old infrastructure, Gulda said. □

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Out-of-the-box middleware

CONTINUED FROM PAGE 61

able, you have an insurance policy for the future," said Joshua Greenbaum, an analyst at Hurwitz Group, Inc. in Newton, Mass. "The software is able to keep up with a company's growth."

Baan's competitors have launched similar programs during the past year, all aimed at attracting midsize user companies. SAP AG was first to market a year ago, and Oracle Corp. followed earlier this year. PeopleSoft, Inc. last month launched its PeopleSoft Select offering for companies in the $50 million to $250 million range.

NEW BATTLEGROUND

This midsize market, with an estimated 30,000 U.S. companies, has become the new battleground for the large enterprise resource planning (ERP) vendors, observers said.

"The midsize market now becoming the big market is a natural evolution of these folks after five or 10 years moving from the old minicomputer and AS/400 base," said Dennis Byron, an analyst at International Data Corp. in Framingham, Mass. "All those [smaller] companies want the same advantages of the big guys. Also, those bigger companies are their customers, and those bigger companies want their supply partners up to speed with the latest technology."

Midsize companies are looking to information technology, and specifically ERP systems, to gain a competitive advantage.

Greenbaum said he warns those users to be careful when weighing whether to go with the cheap and quick preconfigured, bundled programs such as those HP and Baan are offering.

"Users should watch out for the fact that the more a product like Baan or competitors develop a bundled turnkey product, the less of a competitive advantage it will be," he said. "It will look like everybody else's system. But if you are going to get maximum return on your investment, you are going to have to live with very little customization. That's the decision that has to be weighed."

Baan and HP have lined up about 25 resellers nationwide to implement their program. □

ADVERTISEMENT

Rules-driven apps can change as fast as business changes

When a company changes its pricing or credit policies, it can take precious time to implement those changes in a critical application. In the past, making these changes required weeks of technical staff programming and application downtime. This was acceptable when policies seldom changed and internal customer service reps were the primary link to the customer. However, with the advent of the Internet and direct, self-service access to business applications on the Web, support for rapid business change is now a competitive imperative.

A new approach to application development, called "rules-driven" development, shows promise as a means of creating applications which can adapt quickly to business change. Instead of embedding business rules and policies within application code, rules and policies are externalized from the application in a rules-base, which can be accessed by many applications and changed easily (by the business analyst) to reflect policy change immediately. This approach minimizes the need for developers to patch or change existing code, which may run the risk of introducing new bugs into working code.

What are business rules?

Business rules are programmatic implementations of the policies and practices of a business organization. For example, business rules would control the following aspects of a business:

- *When to offer a discount*
- *When to restock inventory*
- *Whether or not to extend credit to a customer and how much to extend*
- *What configuration is valid for a sales order*
- *When to escalate a customer problem*

Business rules and policies are central to any business operation, and yet are often scattered throughout the organization, across applications, manuals, and in individuals' minds. This makes it very hard to achieve consistency throughout a business and to change rules on a company-wide basis.

The concept of centralizing business rules into a single rules engine allows organizations to react quickly to business change. For example, if customers who earn $20,000-$40,000 are better credit risks than those who earn between $60,000 and $80,000, a simple entry in the rules-base will change the existing business rule and apply it to all applications accessing the business rule. The rules-base eliminates the need to locate, change, and test all instances of applications which use the rule.

Applications support a rules-driven approach

A number of products on the market claim to support a rules-driven approach. One company, Neuron Data, leads in this area by providing comprehensive, rules-driven development tools for C, C++, and Java. Neuron Data's Elements product line offers powerful, easy-to-use rules engines within a robust development environment. Elements Presenter/J and Advisor/J are new products that provide the essential tools for building adaptive, self-service applications in Java.

Many of the major wins in the "rules-driven" development arena concentrate on three application areas: e-commerce, call center, and financial services. "Changing the knowledge base used to take six to eight weeks. With Elements we can make the same rule changes in 20 minutes," stated one customer, *American Greetings*. Neuron Data, 1310 Villa Street, Mountain View, CA 94041 Tel: (650) 528-3450, Fax (650) 943-2752,
Web site: elements.com

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The P110, the first 21" (19.5" viewable) Trinitron monitor in existence, is designed for artistic souls whose ideas are simply too big for a smaller screen. The TFT500 flat panel is extraordinary in its ability to fit neatly into confined spaces, like a corner office rampant with paper piles and golf equipment. The P50 and V70 offer the performance and value you'd expect from the best-selling brand of monitors on earth. They also offer the highest refresh rates in their class. A comforting thought for those of us who associate a mere 40-hour work week with part-time employment.

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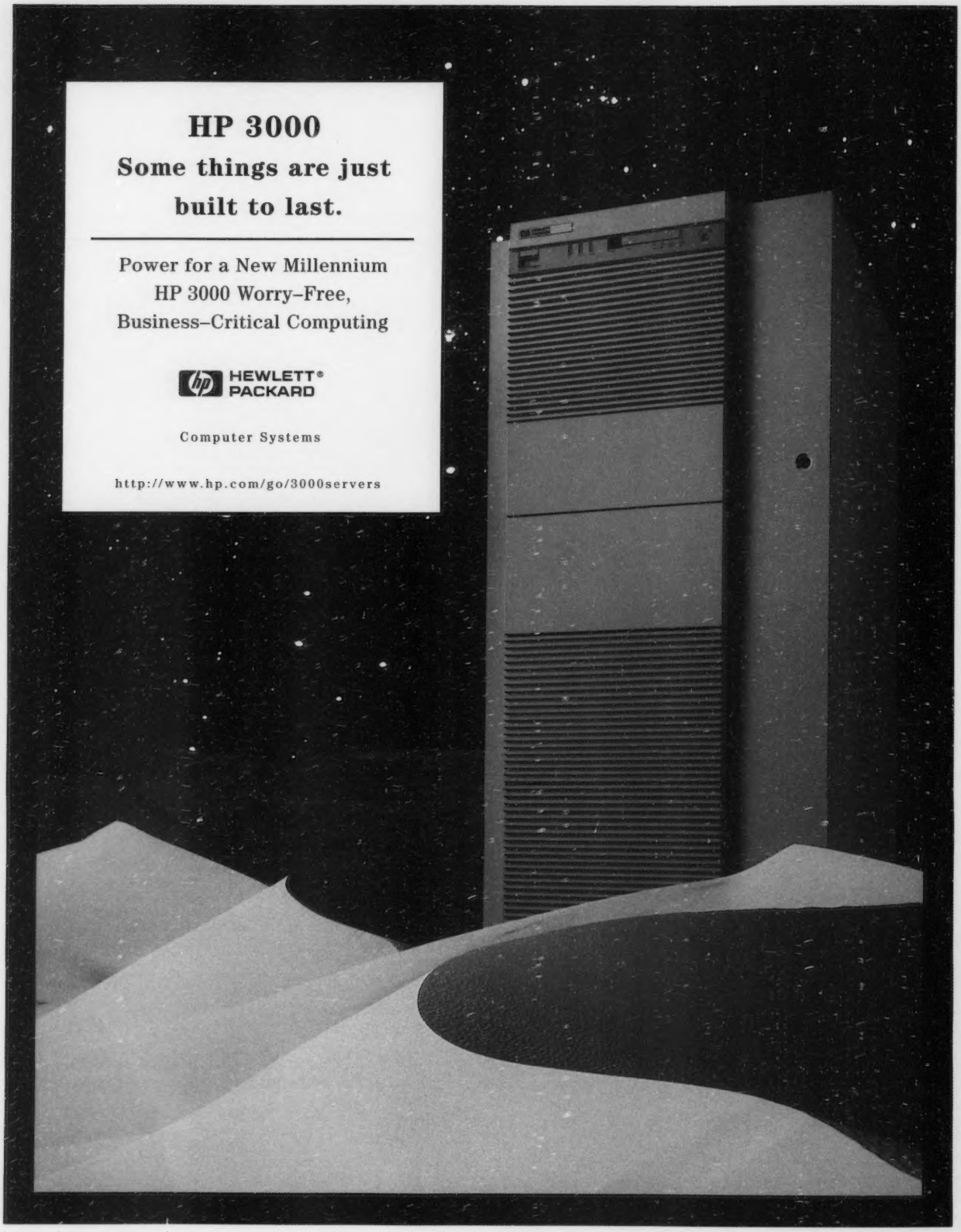

Servers & PCs

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Briefs

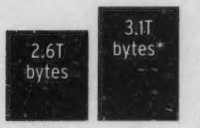
Road warrior aid

Laptop bumblers may find sanity in a 16-page booklet from the Center for Office Technology (*www.cot.org*) in Alexandria, Va. *The Laptop Users' Guide: Practical Recommendations for the Road Warrior* advises laptop users about ways to work more comfortably and efficiently in hotels, airplanes, meeting rooms and offices and at home. Copies cost $6 each and are available at a bulk rate.

Hitachi mainframes

Hitachi Data Systems Corp. in Santa Clara, Calif., early next year will upgrade its Pilot line of CMOS-based mainframes. New features will include extension to 15 partitions in the box and an internal coupling facility for mainframe clustering. Those upgrades will be part of the Pilot P7 models that will ship in the first quarter next year.

Installation of new mainframe disk capacity



Base: 200 IS managers
Source: Soundview Financial Group, Stamford, Conn.

Fibre Channel drives storage into fast lane

By Tim Ouellette

NETWORK TECHNOLOGY is becoming as important as gigantic disk arrays in feeding users' voracious desire for more storage.

And new Fibre Channel networking products are giving information systems staffers the chance to build a storage bypass, so all that data won't create a gridlock on the corporate network.

"Fast disk performance is a network problem, not just a disk problem," said Michael Peterson, president of Strategic Research Corp. in Santa Barbara, Calif., in a recent report.

The point is to create pools of storage, also called storage-area networks (SAN), that aren't tied to specific servers.

Those networks can use high-speed Fibre Channel connections between devices, thereby avoiding the tangle of direct server-to-storage connections that exist today (see chart, page 70).

EASY ACCESS

"This will allow people to have a pool of storage that is accessible to decentralized servers and gets over the distance limitations of SCSI," said John McArthur, an analyst at International Data Corp. in Framingham, Mass.

For example, the radiology depart-

Fibre Channel, page 70

PROCESSING SPEED

Merced may be high-end haven for Intel users

By April Jacobs

WITH ITS 64-BIT chip architecture in the works, Intel Corp. may be extending to users an invitation to cheaper servers, analysts said.

The Santa Clara, Calif., chip maker last week laid out initial but still sketchy details for its IA-64, or Intel Architecture 64-bit chip.

Analysts said the architecture, which is also known as the Merced chip, is likely to debut in 1999 at somewhere between 700 and 900 MHz.

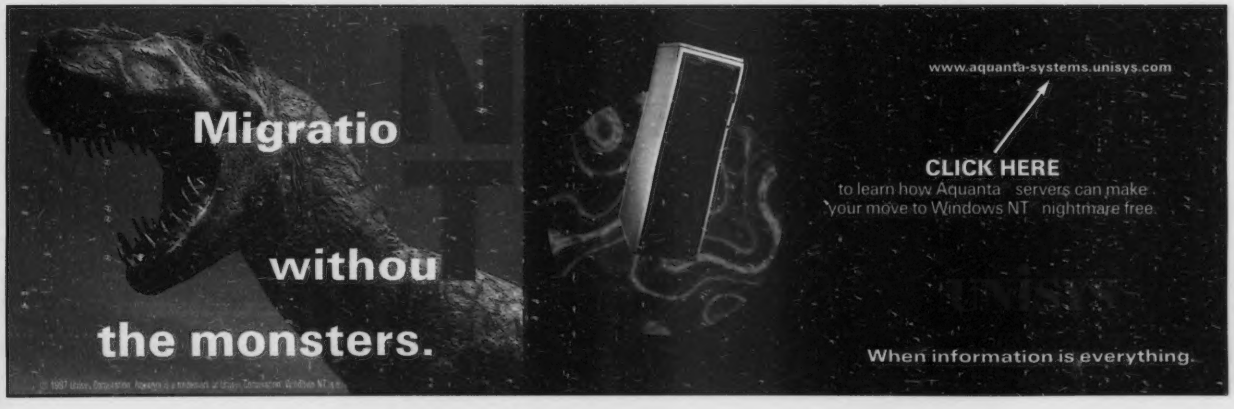
> Merced will be a boon to database users because of its ability to cache large amounts of data.
> – Jane Wright, Datapro

CACHING CAPABILITIES

Industry observers said the first versions are expected to cache up to 1 4G bytes. By contrast, the Pentium II processor, which debuted this summer, features clock speeds of up to 300 MHz.

Jane Wright, an analyst at Datapro Information Services Group, Inc. in Delran, N.J., said the Merced chip will be a boon to database users because it can cache large amounts of data — a feature crucial to performance on such memory-intensive applications.

Merced, page 70



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Fibre Channel puts storage in fast lane

CONTINUED FROM PAGE 67

ment at the UCLA Medical Center in Los Angeles is using a GigWorks Fibre Channel switch from Ancor Communications, Inc. The switch connects a Unix server to three different disk subsystems that contain X-ray image files. It has helped reduce access times to critical X-ray images from 90 seconds to eight seconds, said Lu Huang, a senior technical manager at the medical center.

The decision to go to Fibre Channel was motivated by storage concerns, but the switch "basically increased the whole system throughput," Huang added.

The new Fibre Channel adapters, switches and hubs coming out this fall promise gains over current SCSI connections, with more bandwidth, longer physical connections between disk arrays and support for more devices.

Fibre Channel can move data at 100M bit/sec., can handle up to 120 drives in one connection and will allow up to 500 meters between devices in initial implementations. The latest UltraSCSI throughput is pegged at 40M bit/sec. and can handle 15 drives per connection and 5 feet between devices.

Fibre Channel also is compatible with SCSI. So although a disk subsystem may connect to other disk arrays or servers via Fibre Channel, users can keep their existing SCSI drives running.

HIGH-FIBRE DIET

The benefits of Fibre Channel-based storage-area networks include:

- External storage to keep business data available — even if server fails
- Central storage repositories for backup, archiving and data warehousing
- Remote clustering thanks to improved bandwidth and distances supported over SCSI connections

Source: Strategic Research Corp., Santa Barbara, Calif.

STORAGE PLAYERS

Ancor, in Minneapolis, was one of many vendors that announced or demonstrated new Fibre Channel products at the recent Networld/Interop '97 conference.

Other vendors that will release Fibre Channel products for storage networks include Brocade Communications Systems, Inc. in San Jose, Calif.; McData Corp. in Broomfield, Colo.; Vixel Corp. in Bothell, Wash.; and Gadzoox Networks, Inc. in San Jose.

Users can gain basic benefits from Fibre Channel, but the next wave of products from these players will let "users take on more server clustering issues to share and distribute data more smoothly," said Thomas Lahive, an analyst at Dataquest in San Jose.

Right now, the move to Fibre Channel is happening mostly in high-end, high-bandwidth applications such as the radiology imaging work at UCLA.

But as servers continue to get faster and more powerful — especially with 64-bit hardware support — users will begin to need Fibre Channel to maintain access levels to their data.

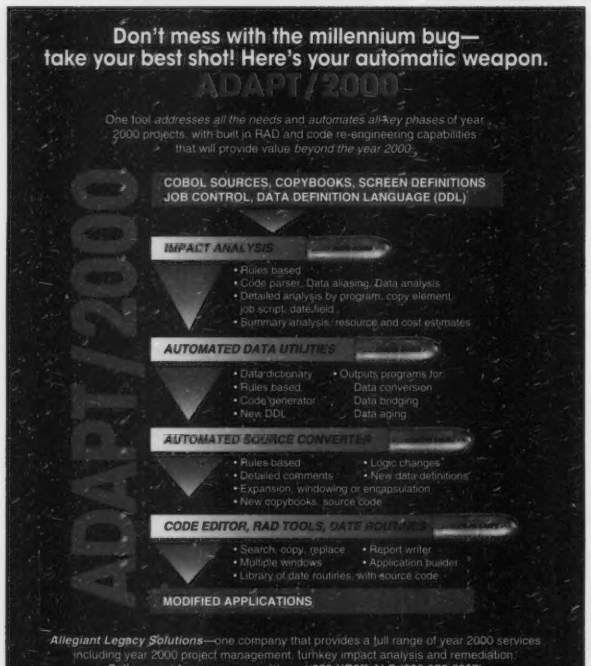
Dataquest predicts that by 2000, more than half of all multiuser storage will be attached to the host via Fibre Channel technology.

To simplify the eventual move to Fibre Channel, analysts expect the leading storage subsystem players to offer their own Fibre Channel switches and hubs — most likely through partnerships with these smaller players.

For example, Sun Microsystems, Inc. this week plans to announce Photon, its latest Fibre Channel storage subsystem, which also comes with a Fibre Channel switch.

Sun also plans to use Fibre Channel disk drives from Seagate Technology, Inc. in Scotts Valley, Calif. in the Photon arrays.

Among other deals, McData is already a subsidiary of storage mainstay EMC Corp. in Hopkinton, Mass., and disk maker Seagate took an ownership stake in Gadzoox this summer. □



Merced may help users on high end

CONTINUED FROM PAGE 67

Wright said Digital Equipment Corp.'s AltaVista search engine is a good example of what 64-bit performance can do. Because AltaVista runs on a 64-bit Alpha server, the search engine can cache more data than a 32-bit server and provide more information faster.

"There is just no way that you could get that kind of performance from a 32-bit architecture," Wright said.

For most users, the technology is too far in the future to affect current purchasing plans. But users who bite most quickly, such as financial firms that need real-time data for applications such as stock trading, may be likely end users of the technology, observers said.

One member of the board of directors at a large financial company in New York said, "We have tried to use some of the existing 64-bit technology available today but found that porting to NT was too difficult.

"But when the technology comes around and matures, there will definitely be users, especially database application users," said the user, who requested anonymity. Intel and Hewlett-Packard Co. co-developed the foundation 64-bit architecture that Merced and other IA-64 chips will run on.

"HP is very strong in the enterprise, and Intel wants to be the strongest in the enterprise as a chip maker. So this move effectively legitimizes Intel [at the high end] and is a very strategic relationship for HP," said John Dunkle, president of Workgroup Strategic Services, Inc. in Portsmouth, N.H.

Rob Enderle, an analyst at Giga Information Group, Inc. in Cambridge, Mass., said server pricing for high-end systems could drop considerably once Intel begins mass-producing 64-bit chips.

Enderle said comparable systems cost about $100,000, whereas Intel-based systems that run Windows NT would be in the $10,000 to $20,000 price range. □

NEW PRODUCTS

EXP COMPUTER, INC. in Irvine, Calif., has announced the Data Traveler 336E, a Type II PC Card fax modem for notebooks, palmtops, Windows CE handheld devices and AppleMessage Pads.

The 33.6K bit/sec. card has a detachable battery pack. It costs $199.

EXP Computer
(714) 453-1020
www.expnet.com

ADVANCED LOGIC RESEARCH, INC. in Irvine, Calif., has announced the ALR Evolution Series of business-class desktops, which incorporate Intel Corp.'s LANDesk Client Management and desktop management interface support. Pricing for the Evolution 4000 starts at $1,019. Pricing for the Evolution 5000 starts at $1,151. Pricing for the Evolution 6000 starts at $1,645.

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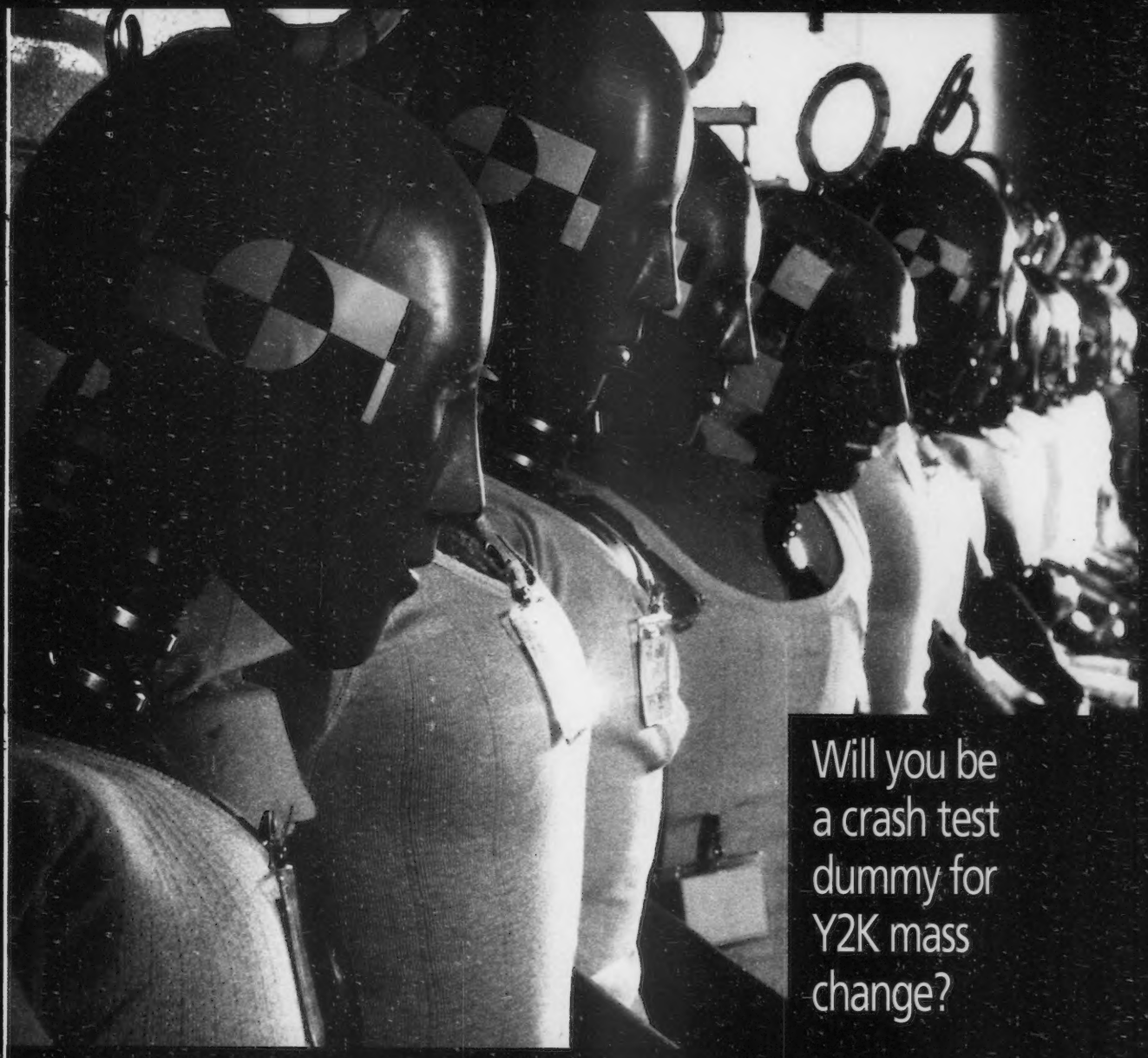

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Data Warehousing

Special Section: Data Mining • Decision Support • Strategies

Briefs

HP service offering

At the recent DCI Data Warehouse Conference in Phoenix, Hewlett-Packard Co. announced a services offering to hook its OpenView network and systems management software to data warehouses. HP officials said the OpenWarehouse Management Suite will let warehousing managers set up service-level agreements with end users, then track query response times and other usage conditions on the fly. Pricing for the suite is expected to range from $50,000 to $100,000 for consulting services and the OpenView software. There are no plans currently to turn it into a packaged product.

Meta data links

The Metadata Coalition, a group of more than 50 data warehousing vendors and users, recently announced that its specification for exchanging informational meta data is being linked to Microsoft Corp.'s software development repository. A software translator is being built to convert data back and forth between the Microsoft repository and the coalition's Metadata Interchange Specification. The coalition also will work with Microsoft to review future interoperability extensions to the repository. Meta data acts as a card catalog and end-user navigation aid for data warehouses.

Data analysis tool

Prism Solutions, Inc. in Sunnyvale, Calif., recently announced a consolidated version of two products for analyzing data quality that it bought in July. The software, now called Prism Quality Manager, can be used in data warehousing and application conversion projects. New features include added support for Informix Software, Inc. and Sybase, Inc. databases and the ability to analyze multiple databases at once. Pricing starts at $70,000, and general release is scheduled for November.

Tooling around

▸ ERP vendors bundle in free analysis tools; they aren't for everyone

By Randy Weston

AS DATA WAREHOUSING becomes a standard item on corporate computing shopping lists, ERP application vendors are beginning to bundle in free data analysis and extraction tools.

Warehouses from enterprise resource planning (ERP) industry giants SAP AG, Oracle Corp. and PeopleSoft, Inc. promise users quick, cheap and relatively easy-to-use versions of these increasingly popular analytical tools. The vendors are using a mix of their own developed products and tools from established third parties (see related story, page 76).

And free is key. Building a data warehouse from scratch can take anywhere from 18 to 36 months and can cost $1 million or more.

For internetworking company Bay Networks, Inc. in Santa Clara, Calif., a data warehouse from its application vendor, SAP, is just what the database administrator ordered. The $2 billion company, which is now a beta tester for SAP's Business Information Warehouse (BIW), hopes the product will resolve the nonstop problems it has had getting R/3 data into a 400M-byte Oracle-based data warehouse that is tied to Arbor Software Corp.'s Essbase online analytical processing (OLAP) server. With almost 80% of Bay's data being generated in R/3, the BIW is set to replace the old system and become the enterprise warehouse.

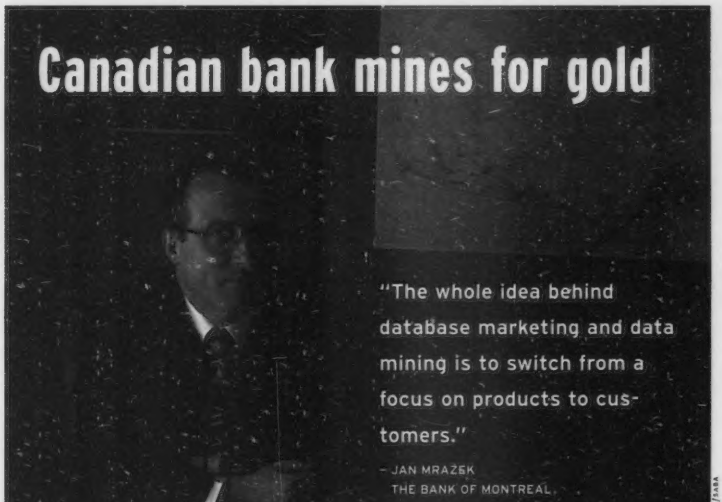
ERIC MILLETTE

Bay's Ari Bose: The company will switch to SAP's Business Information Warehouse

"One of the problems we have is, everyone working in the data warehouse group has to have knowledge of the underlying SAP data," said Ari Bose, director of SAP systems and data management at Bay. "The extraction process also needs continuous monitoring. Every time

Tooling around, page 76

Canadian bank mines for gold



REG CHARD/IDEA

By Linda Wilson

THE BANK OF MONTREAL wants to offer its customers the right product, at the right price, at the right time. And it wants to make money doing so.

The bank hopes sophisticated data mining techniques will help it do just that.

DATA MINING

Using advanced techniques in mathematics and artificial intelligence, data mining uncovers complex patterns or models in data. Those models are then used to help solve business problems that come up in direct marketing, credit-risk evaluation, fraud detection and other areas.

At The Bank of Montreal, that means taking information about bank customers — their assets, services they use and their history of account fees, for example — and crunching it to determine what products and prices can be customized to fit their individual needs.

"The whole idea behind database marketing and data mining is to switch from a focus on products to customers, to view them as households and analyze their portfolios," said Jan Mrazek, manager of the data mining group at the Toronto bank. The bank was founded in 1817 and has $101 billion in assets.

The bank already has crunched the data on its 5.1 million customers and come up with a profitability figure for each — that is, how much revenue each customer generates for the bank in account fees and interest.

Those calculations took a staggering 1.5 years to crunch, primarily because the data-gathering process was time-consuming and complex, Mrazek said. Those calculations are processed and stored on an

Bank, page 76

COMMENTARY

The trouble with training

SHAKU ATRE

BECAUSE MANY data warehouses are built on client/server architectures, it's not surprising that data warehousing faces many of the same challenges and problems as client/server systems. One of the most common difficulties: Training often is underfunded and underappreciated.

Let's focus on data marts and small departmental client/server applications. Between them, there are many parallels that impact training. Exploring these correspondences may help you turn a pound of hard-won client/server lessons into an ounce of data mart prevention — or vice versa.

• First of all, both client/server applications and data marts rely on new concepts and processes that aren't easily understood by users or technical staff. But many peo-

Trouble, page 76

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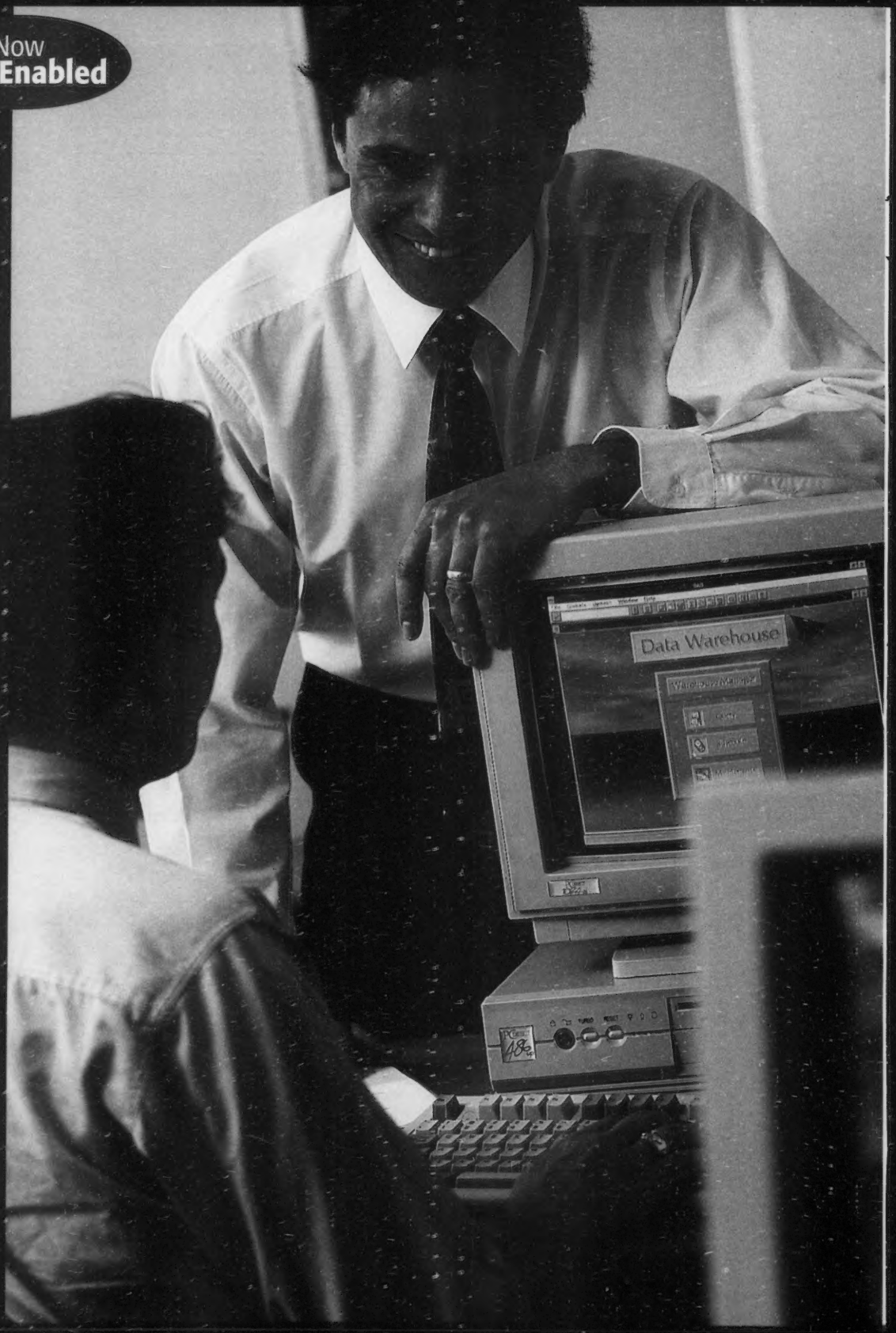

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Bank mines for gold

CONTINUED FROM PAGE 73

IBM SP2 server.

The bank then looked at each customer of its online banking service, Mbanx. It scored each customer and assigned each to a group of similar customers, such as highly educated people who are unprofitable in checking and savings accounts but profitable in mortgages and loans. That was accomplished by feeding to the data mining tools the profitability figures, demographics and behavioral variables.

The bank used clustering, available from IBM's Intelligent Miner data mining tool, to do that.

"Generically, what clustering identifies is how things are clumped together," said Herbert Edelstein, president of Two Crows Corp., a Potomac, Md.-based consultancy that specializes in data mining.

Using advanced techniques in mathematics and artificial intelligence, data mining uncovers complex patterns or models in data.

But he warned it won't reveal cause-and-effect relationships — merely associations.

"There may be cause and effect, but you need to go outside data mining to find it," such as through assumption or hypothesis based on experience and business knowledge, he said.

Return on investment for the project hasn't been calculated, Mrazek said. He declined to provide cost figures.

The bank plans to update profitability calculations and customer clusters monthly, beginning next spring. The results will be stored in the Bank Information Warehouse, which resides in a DB2 database on an IBM 3090 mainframe that runs MVS. Information pertaining to Mbanx customers also will be stored on a data mart, an Oracle 7.3 database running on an IBM RS/6000. □

Wilson is a freelance writer in Glen Ellyn, Ill.

Tooling around

CONTINUED FROM PAGE 73

someone comes up with a new area to analyze, it's a huge project for us. It's a constant warehouse hog. When we do upgrades of the application, we have to do a lot of work in warehouse testing, too."

NOT GOOD FOR ALL

Henry Morris, an analyst at International Data Corp. in Framingham, Mass., argued that an R/3-specific warehouse from SAP would be useful for a company such as Bay, which has so much of its data generated by R/3. But for companies with data such as market research that is stored elsewhere but needs to be analyzed with R/3-generated data, the application vendor's product falls short.

"It is very difficult to pull data out of SAP because of the way it is structured," Morris said. "Some people with diverse systems may in fact use the Business Information Warehouse as a jumping off point to an enterprise data warehouse. But in the broad view of most companies, SAP is only one data source among many."

Morris said having to translate non-SAP data into a form that the BIW will understand also takes work. Bose said that has been a task, but it hasn't been nearly as troublesome as pulling data out of R/3 and into an independent data warehouse.

Other users are keeping a cautious yet interested eye on the offerings, waiting to see if the vendors' promises of tight integration with ERP software systems are enough to scrap other data warehousing plans.

"It's a wait-and-see attitude," said David Chesson, director of the SAP implementation project at Occidental Chemical Corp. in Dallas. The company is standardizing on SAP's software system. "Strategically, we would probably migrate to BIW as a data warehouse for both legacy and SAP system data."

Those "ifs" include whether it is scalable for enterprise use; how hard it is to import non-SAP data into the system; and if it will have powerful enough OLAP capabilities. SAP is expected to add a multidimensional OLAP tool with the second version of the BIW, due in the spring.

MORE IS BETTER

Wayne Eckerson, an analyst at Patricia Seybold Group in Boston, said no matter which ERP system you use, letting one vendor provide most or all of your enterprise systems is an attractive but dangerous proposition. "You want to use a warehouse as a lever to keep your systems open," Eckerson said. "Data should not be controlled by an ERP vendor. You are giving too much control over your data resources."

But some users are willing to trade that for the ease of a quick data warehouse package.

Don Zimmer, database administrator at Harcourt Brace & Co., a publishing company in Orlando, Fla., said the more one vendor can provide, the easier it is for users. Harcourt is installing PeopleSoft's applications and is considering some of the data warehouse tools that come with them.

The ERP warehouses "can get users started with the technology and let them explore what kinds of things they can do without having to design a data warehouse from square one," Zimmer said. □

ERP data warehousing offerings

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Data warehouse will reside independent of the transaction-processing applications, so it won't interfere with transaction processing. But it will have R/3 business rules embedded, so users can more easily analyze R/3-generated data. Outside data also can be loaded. No multidimensional analysis capabilities will be available until the second version.

Available: Q1 1998 with R/3 4.0 applications package

PEOPLESOFT, INC.

No data warehouse, but an application package is integrated with Cognos, Inc.'s PowerPlay and Arbor Software Corp.'s Essbase OLAP tools. PeopleSoft Version 7.0, which hit the market last month, comes with a cube manager that will let users define the data they want to extract into an OLAP cube for analysis.

— Randy Weston

Trouble with training

CONTINUED FROM PAGE 73

ple think these matters should be obvious. Only products should require training, they argue. But training often fails when there's no conceptual foundation for learning.

- Client/server applications and data marts both have graphical user interfaces (GUI) that look easy to use, but that doesn't mean managers can skip necessary product training. Even IT may skim over training when the supposedly "completely intuitive" GUI appears on design tools or other software for technical staff. And because client/server applications and data marts often use components from multiple vendors, the training gap grows with each product added.
- Both systems often are built by departmental users who rebel against IS, which can lead to a wealth of disparate multivendor systems spread throughout the organization and a further proliferation of tools needing support. And although both tout open systems, they usually rely on proprietary tools for key functions.
- Client/server and data marts both have risen rapidly and use new products that often need frequent upgrading. That means companies have a hard time finding the staff they need and often must retrain current staff. But a tight personnel market pushes salaries upward and destabilizes a company's staff if members leave once they're trained in the new technology and tools. To prevent this, many managers minimize training.
- Both disciplines heavily involve users in planning and development, which means uneducated users can impact success more than ever. At the other extreme, both types of implementations also must deal with power users who think they know better than IT and use defective information to push their points of view.
- Both implementations tend to cost more and take longer than expected. That creates pressure to cut corners, especially on low-glamour activities such as training. Budgets can span departments, further boosting the pressure to trim training-induced tedium and delay.
- Both systems use iterative design methodologies instead of traditional waterfall techniques, which means developers often don't have a clear grasp of all the steps they need to take to get a system up. There can be a waterfall, nonetheless; problems will cascade when a successful prototype goes into production, gains usage rapidly and starts breaking any component that won't scale.
- In both systems, designers often skip formal data modeling practices and skimp on planning. That leads to two related results: Training becomes an afterthought, and there are few trained people to handle the fallout when poor planning engenders chaos.
- Both systems often face significant challenges in dealing with legacy data and the IT staff that knows the mainframe technology that creates and stores this data. Both make heavy demands for connectivity via networks, an area for which in-house support is thin.

Just because these training challenges haven't been well met in client/server systems doesn't mean history must repeat itself with data marts. But to avoid a repeat, you need a lot of foresight — and the money to actualize its fruits. □

Atre is president of Atre, Inc., a consulting firm in Port Chester, N.Y., that specializes in data warehousing and database technology. She can be reached at (914) 939-0045 or by E-mail at shaku@atre.com.

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ERIC YANG

Testing CAN'T WAIT

YEAR 2000 CONVERSION MANAGERS SAY TESTING WILL TAKE UP 50% – MAYBE AS MUCH AS 70% – OF YOUR TIME AND EFFORT. BUT YOU CAN GET A HEAD START. BY ROBERT L. SCHEIER

If you wait until 1999, 1998 or even next month to begin testing your year 2000 repairs, you'll be too late.

You need to start the test process now if you want to make sure critical business processes don't fail because your systems can't tell the difference between the 20th and 21st centuries.

Year 2000 project managers expect testing to soak up as much as 70% of all year 2000 efforts. Ed Hourihan of Phoenix Home Life Mutual Insurance Co. in Hartford, Conn., began testing more than a year ago, and even he wishes his company had allotted more time than it did to help the business and technical staffs work through the complexity.

YEAR 2000

The testing challenge can include figuring out which applications are most critical and should be tested most stringently and/or finding extra room for test data on mainframe disk drives.

Testing can't wait, page 82

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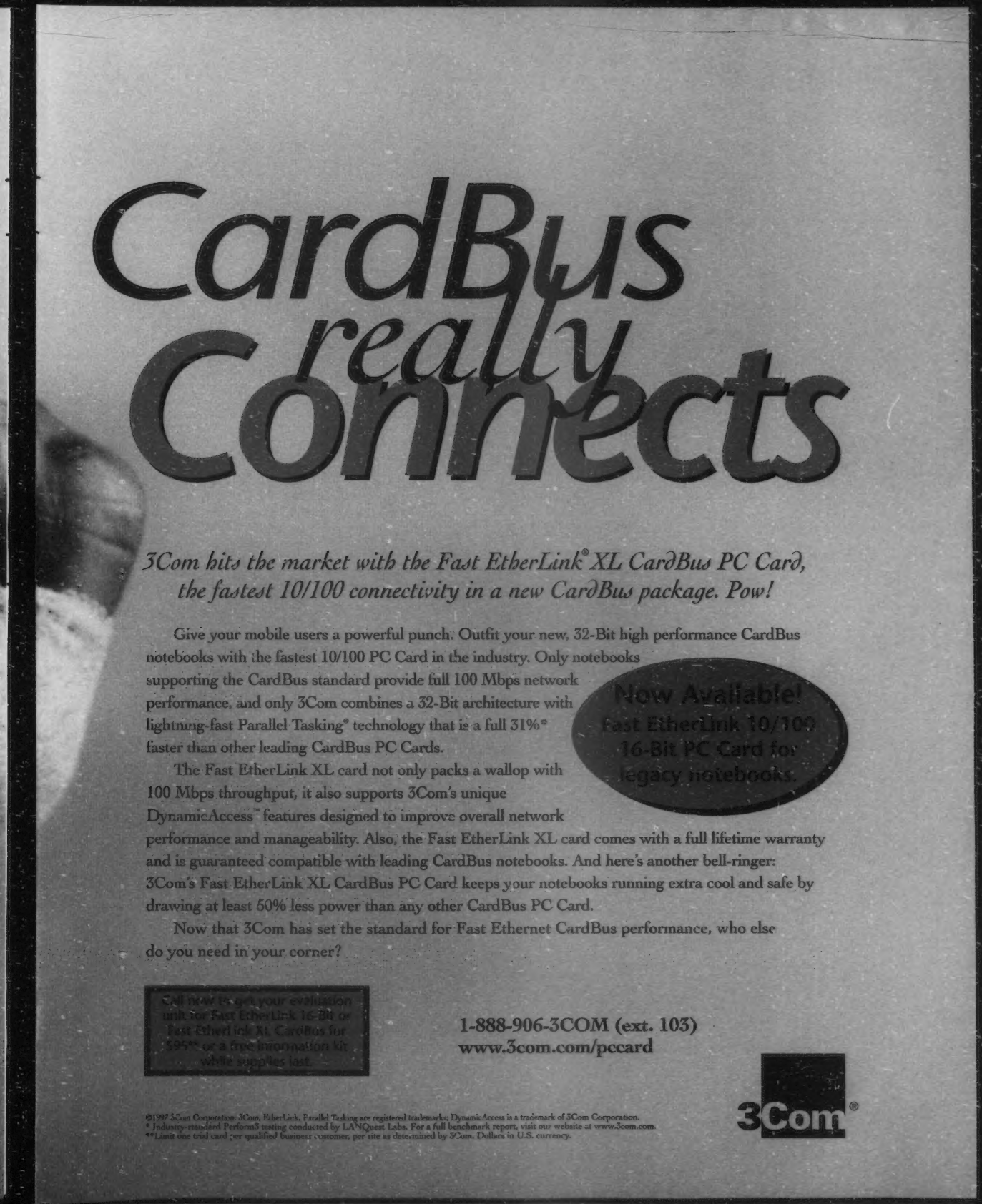
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Testing CAN'T WAIT

CONTINUED FROM PAGE 79

Year 2000 managers are coping by testing only critical applications, rushing parts of applications back into production after minimal testing and delaying in-depth testing until 1998 or 1999.

Here's what you have to do, why you have to do it and how to do it.

ASSESS YOUR APPLICATIONS

Rather than trying to fix all their year 2000 problems, most managers are performing triage. They're isolating the most critical business processes and doing repair work first on the applications and databases needed to accomplish those tasks.

That analysis, usually one of the first jobs in a year 2000 repair effort, also can be used to build the test scripts and test databases that will be needed later.

At Boston Mutual Life Insurance Co. in Canton, Mass., the most critical applications "are our administrative systems, and our claims payment systems — anything that ships money out the door," says Bill Dillon, director of management information systems. Next come systems that rate customers by risk and calculate premiums, followed by systems that merely generate reports.

YEAR 2000

Boston Mutual has organized its year 2000 work in 10 segments, each of which reflects a part of the business, such as accounting or the output from the company's life insurance systems. A manager for each segment determines which code and data are needed to carry out that function and schedules repairs and testing for them.

By identifying which programs those functions run, the year 2000 team can isolate the most critical code into separate libraries for repair and testing, Dillon says.

Analysis teams at The Clorox Co. in Oakland, Calif., went through the same exercise, says Joe Romello, service delivery director at Interim Technology, a Fort Lauderdale, Fla., service provider that has helped Clorox with its year 2000 work.

With about an 80% success rate, "we could pull a string in accounts payable and find all the [mainframe] jobs the users believed were necessary to support [that] process," Romello says. The teams copied every instance of those jobs as the basis for tests of the repaired code.

Nabisco, Inc. in East Hanover, N.J., is using data and actual transactions from its manufacturing resource planning and purchasing systems as a model for testing, says senior director Tony Del Duca. "This data is real data we've captured from normal runs of our system," he says. After identifying when and how these actual transactions use dates, Del Duca says the test team can easily build test scripts for repairs to those parts of the system.

BUILD YOUR TEST PLAN

Because testing takes up so much time and money, you'll need to build it in to your budget early and warn your internal business partners. You'll also have to make tough decisions about what to test, when to test it and how thoroughly to test it. That requires a test plan.

Ideally, developers first test each module of an application, then the entire application, and then the application as it works with other applications and databases. But because the year 2000 problem is so complex, such integration testing is never going to happen, says Bill Schuyler, a senior IS staff specialist at Sunstrand Corp., an equipment manufacturer in Rockford, Ill.

Instead, "you have to do it in chunks" that reflect how users tap multiple applications to get their work done, rather than modules of individual applications. Nor should your plan simply be to test every possible link between every possible system as if all links were of equal importance.

But which chunks do you test? In Schuyler's case, they were the code and databases required to perform a business process. For example, he says, Sunstrand will fix its purchasing module, "and we'll test that, as well as the interfaces [to other systems] that purchasing affects on a daily basis" rather than test how that module works with every other application in the enterprise.

Most managers break the testing into several stages so they can test code as it's fixed without waiting for other modules or vendor-supplied software to be ready.

The Canadian Imperial Bank of Commerce in Toronto, for example, is testing repaired code against current data to ensure the repair process hasn't introduced bugs.

Second-level testing, most of which is scheduled for next year, will test the fixed code against dates on and after Jan. 1, 2000. It will probably be 1999 before the bank tests the fixed code in a total environment in which operating systems, middleware, database platforms and system clocks have all been updated to 2000.

Adding to the complexity is the way new systems and the links between them have grown like vines over the years. "When your applications become tighter and more integrated, the test bed creation process becomes much more complex," due to the complex interactions between application logic and the databases they access, Schuyler says.

For example, Sunstrand, which has about 7.2 million lines of in-house code to repair, has been developing test beds for a year and has only about 60% completed. Schuyler expects to have a full set by April.

CHOOSE YOUR TOOLS

Knowing which tools to use and how much of the test process can be automated is critical to firming up your budget and schedule. But if you waste too much time looking for the perfect tool, you'll never get started.

Choosing "test" tools begins long before testing, when you're analyzing your year 2000 problem. Because the better tools you have to analyze and tag date dependencies, the more quickly you can fix and test the systems.

At Nabisco, Del Duca used McCabe Visual 2000 from McCabe & Associates in Columbia, Md., to analyze the importance of the repairs done to each module and thus decide whether to test those changes. For instance, if a "00" date shows up in a report, "the report would not blow up," he says. A date used as an index for a database, on the other hand, is critical.

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When he is evaluating test tools, McLean says he looks for those that will work with the multiple databases and operating systems in today's mixed computing environments. User-friendliness is another key feature, he says. Rather than have to hire a specialist or pay for training, McLean says he wants to "walk somebody in off the branch banking environment" and put them to work on testing.

It also may be important to evaluate the company behind the product. That is especially true for a small company such as McCabe, but Romello says he was pleased to find it hadn't stretched its technical staff and was instead "short on sales staff and ... very, very heavy on development staff."

Given the relatively short time span of year 2000 work, some customers aren't too worried about a vendor's long-term prospects. "You need to see a three-year, four-year window [of viability] but beyond that, it isn't as important," Hourihan says.

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Looking for more information on the year 2000 problem? Visit our Web site, and look through our Year 2000 Resources page: *www.computerworld.com/year2000/y2k_res1.html*

With many of the leading test tools offering similar capabilities, Schuyler says managers shouldn't spend too much time comparing them. "Find a tool set that fits into your organization and that you're comfortable with, but don't expect it to handle everything," he says.

MANAGING THE PROCESS

One major challenge, especially for companies that can't afford to buy separate mainframes for testing, is squeezing "virtual machines" and extra data used for testing onto existing mainframes.

"We dramatically underestimated the amount of DASD [Direct Access Storage Device] space that was going to be required" for test data, Dillon says. Without the money to buy more mainframe storage, the year 2000 team "had to work with the technical support people on almost a daily basis to free up space" for testing, he says.

Getting support from the company's top ranks also is crucial because without that clout, getting testing help from business-savvy users "can be very difficult," Dillon says.

With hundreds or even thousands of modules going through one or several tests, "the entire year 2000 problem has created a set of bookkeeping and management processes that heretofore did not exist," Romello says.

"It's complex because there's 150 systems on the mainframe side, many of which talk to one another," requiring testers to coordinate the preparation of test logic and data among many different application groups, McLean says.

The good news, he says, is that he doesn't "believe it's an impossible or can't-do task"— as long as year 2000 managers get started now. □

Scheier is Computerworld*'s senior editor, management.*

WHO'S USING WHAT

THE CLOROX CO.

SIZE OF PORTFOLIO: More than 36 million lines of mainframe code.
CONVERSION METHOD: Changes to application logic, windowing, date-field expansion.
AMONG THE TOOLS USED: Vantage YR2000 from Millennium Dynamics, Inc. (*www.dynam.com*) in Cincinnati for field expansion, as well as data and logic windowing; Time Warp from Platinum Technology, Inc. (*www.platinum.com*) in Oakbrook Terrace, Ill., for simulating system dates; QAHiperstation from Compuware Corp. (*www.compuware.com*) in Farmington Hills, Mich. to capture CICS transactions for future playback; Compuware's File-AID for source code management; and McCabe Visual 2000 from McCabe & Associates (*www.mccabe.com*) in Columbia, Md., to find and tag year 2000 dependencies in code. The repair team wrote its own data-aging software.

NABISCO, INC. (manufacturing, distribution and logistics systems)

SIZE OF PORTFOLIO: Thirty-five systems that run on mainframes, PCs and IBM AIX servers.
CONVERSION METHOD: Windowing and expansion.
AMONG THE TOOLS USED: McCabe Visual 2000 to identify complexity of code and cruciality of dates within code; and Quintek PLUS from RCG Information Technology in Edison, N.J., (*www.quintic.com*) for evaluation and remediation.

SUNSTRAND CORP.

SIZE OF PORTFOLIO: 7.2 million lines of code, 1.9 million of which have already been repaired.
CONVERSION METHOD: Windowing.
AMONG THE TOOLS USED: Compuware's File-AID to create test data, and Beyond 1999 from CCD Online Systems, Inc. (*www.ccdonline.com*) in Arcadia, Calif., to age-test data. Compuware's Xpeditr/Xchange was used to simulate turning ahead the system clock on the test portion of mainframes.

NORTHEAST UTILITIES

SIZE OF PORTFOLIO: Approximately 30 million lines of code in 1,500 applications.
CONVERSION METHOD: Windowing where possible, date-field expansion where absolutely necessary.
AMONG THE TOOLS USED: WinRunner 2000 from Mercury Interactive Corp. (*www.merc-int.com*) in Sunnyvale, Calif., to capture and play back user interaction with systems; Vantage 2000 from Millennium Dynamics to do automatic code changes and age-test data; and HourGlass 2000 from Circle Computer Group (*www.circle-group.com*) in Wayne, N.J., to simulate turning the system clock ahead to 2000.

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YEAR 2000 SCOREBOARD

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Updates from the front

Some recent news on the year 2000:

▸ **Lou Marcoccio,** a research analyst at Gartner Group, Inc. in Stamford, Conn., says the labor market dedicated to fixing the year 2000 will be at 75% capacity by April. But most of the 25% left could be limited in experience, with some fresh out of college.

▸ **Capers Jones,** in his upcoming book, *The Year 2000 Software Problem: Quantifying the Costs and Assessing the Consequences* (Addison-Wesley): "Current data indicates that at least 15% of software applications [in the U.S.] will not be repaired in time."

▸ **Matt Hotle,** a Gartner Group research director for year 2000 strategies: Companies must "plan to fail" with their year 2000 work and begin to make contingency plans in case some of their software fails to work on Jan. 1, 2000.

Outside the company

Most companies are just now figuring out how to coordinate their year 2000 repairs with those done by their suppliers or customers. Unless everyone in the supply chain fixes their systems at the same time, and in the same way, they risk infecting one another with bad data.

Ed Yourdon

Author and industry expert Ed Yourdon pushed that message in a recent presentation in Newton, Mass., sponsored by Cutter Consortium, an information technology advisory firm in Arlington, Mass. Yourdon is chairman of the consortium.

Yourdon told executives that they must stress to senior management that fixing internal systems is only 20% to 40% of fixing the year 2000 problem.

To help convince senior management about the seriousness of dealing with noncompliant suppliers and customers, he advises managers to ask the following question: "What if we lose a major supplier for a month? A year? Two to three days? A decade?"

The Clorox Co. has plunged right into that part of the year 2000 problem. The household products company in Oakland, Calif., has a big supply-chain problem and an aggressive plan to solve it, says Joe Romello, a service delivery director at Interim Technology in Fort Lauderdale, Fla. Interim Technology is the services firm that is helping Clorox with its year 2000 work.

Clorox has a whopping 1,100 interfaces with its trading partners. If a large grocery chain, for example, begins expecting four-digit dates before Clorox is ready to transmit them, Clorox has to adjust its electronic interface with that chain to translate two-digit dates into four digits.

To cope, Clorox has separated its interfaces into three categories, each of which runs on its own Hewlett-Packard Co. HP-UX server. One group includes the interfaces Clorox will never change; the second has the interfaces that will have to change sometime in the next year; and the third includes interfaces Clorox expects to change repeatedly before its year 2000 work is done.

The three new servers sit between the outside world and an existing HP-UX server, which is the front end to Clorox's legacy mainframe systems.

Breaking up the interfaces into three groups, each on its own server, makes it easier for Clorox to track and update interfaces as its business partners fix their year 2000 problems at their own speed. — *Robert L. Scheier and Rick Saia*

How liable are you?

Can a chief information officer be held liable if the company is sued for failing to become year 2000-compliant? The answer is yes — if the CIO is considered an officer under a company's bylaws or articles of incorporation, or if the firm's directors sign contracts affirmatively authorizing officers, according to litigation attorney Steven Brower and consultant Warren S. Reid, both of California.

But even if a CIO isn't called an officer in any document, he still could be liable, Brower and Reid wrote in a recent report. The report, "Year 2000 Computing Crisis," published by the Atlanta-based Information Management Forum, cites Los Angeles cyberlawyer Richard L. Bernacchi.

He says if a CIO is involved with corporate strategic planning; is allowed to make spending decisions of at least $1 million on hardware, software and outsourcing; and usually gains senior management's approval for his recommendations, then the CIO may well be considered an officer. □

Time is money

Technology Management Reports, a San Diego-based research firm, estimates it will cost a company $1.30 per line of code to bring programs into compliance — if it begins its work by year's end. But the later you begin, the more you may pay, according to the firm. Year 2000 consulting fees are climbing to about $1,500 per day, according to the researcher. That will rise to $2,000 in a year and to $2,500 by 1999.

	COST PER LINE OF CODE
1st half of 1998	$1.75
2nd half of 1998	$2.35
1st half of 1999	$2.95
2nd half of 1999	$3.65
1st half of 2000	$4

The year 2000 lexicon

An industry isn't an industry until it has its own jargon. We've picked up the following samples in our year 2000 reporting rounds:

Time machine: Separate physical or logical machine (usually mainframe) that lets you run year 2000 tests without corrupting production systems. As in: "I'm really sweating out testing because we can't afford a time machine."

Antique system: A system so old you don't even know who built it, or why. Different from a "legacy" system, in which you at least know the previous owner.

Process triage: A fancy way to say you're so far behind on the year 2000, you can only do the most vital tasks. By doing triage on the work, you decide what you absolutely need to do to keep your job.

And, from author and industry leader Ed Yourdon:

Year 2000-compliant: When a company's computer systems can recognize 2000 and beyond in data generated within its own systems.

Year 2000-robust: When a company's systems can recognize 2000 and beyond internally and in data exchanged with business partners.

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Reliability	79%	57%	76%	67%
Manageability	50%	17%	36%	19%
Expandability	76%	43%	48%	40%
Compatibility	82%	50%	64%	51%
Overall Satisfaction	79%	50%	52%	37%

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META Group, Inc.

New Dimensions in the Data Center

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New Dimensions in the Data Center

In most corporations, the enterprise data center contains a hodgepodge of hardware and software (e.g., multiple flavors of high-end Unix, OS/390 and other proprietary systems), requiring disparate support infrastructures and offering little in the way of integration. Since this is unacceptable to the customer, IT groups and vendors are working to unify these technologies

BY BRUCE ALLEN
Vice President, META Group
Enterprise Data Center Strategies

through integration "middleware," migration to common platform architectures and the provision of multiple "personalities" in a single box.

With these technologies viewed as back office, and newer network computing technologies considered front office functionality, the challenge for IT organizations (and vendors) is to join both capabilities seamlessly by providing a "middle office" set of systems and procedures that "glues" the other two together (see Fig. 1).

As more back-office (and some front-office) tasks are relegated to external providers (e.g., outsourcers), most Global 2000 companies are developing a mix of internal and external service provisioning. IT's expanded purview of responsibility encompasses the needs of customers, external suppliers, e-commerce linkages, and processes that are cost-effective with the current environment.

The challenge is heightened by new initiatives such as data warehousing, network computing, business intelligence, e-commerce and "Webification" of business applications. Along the way, remedial issues such as Year 2000 compliance and Euro conversion (which are consuming as much as 30% of IT resources and budgets) must also be addressed. To achieve these goals, IT groups must prioritize the elements that will ensure that changing customer requirements are met, as well as identify criteria for selecting strategic vendors to share the burden of meeting these goals.

Of the ten critical success factors META Group has identified for the future enterprise data center (see p. 4), this supplement will focus on four: integration, scalable/flexible platforms, universal data/media and asset management.

Although IT has ultimate responsibility for customer satisfaction, vendors also play a key role. IT must make tough choices now on which vendors will help energize their future enterprise data center.

Ten Principles for the Success of the Future Enterprise Data Center

1) Integration: To ensure optimal flexibility for users to access systems and data across disparate platforms and networks, a mix of off-the-shelf technologies (e.g., MQSeries, DCE, ORBs, distributed transaction monitors) must be complemented by IT services. Network gateways, bridges, routers, channel attach and other mechanisms are also required to link information resources. Encryption, authentication, network firewalls, resource access/control and intruder monitoring must be addressed via a cohesive security policy and implemented with the appropriate tools.

2) Scalable/flexible platforms: Short- and long-term scalability of CPU (server), memory, data storage and network bandwidth must be assured, with flexibility to adapt to new technologies in each category.

3) Universal data/media (storage): Technologies include open storage, backup/restore software, tape devices, automated tape libraries, hierarchical storage management (HSM) software and database monitoring software that address all platform requirements. Management support includes backup, restore, archival, data placement and usage monitoring.

4) Asset management: This is achieved through the implementation of the aforementioned items, as well as the traditional capabilities of inventory, configuration, contract and vendor management.

5) Application management: Provides application development, software life-cycle management tools, configuration/change management, and all associated support services.

6) Workload management: Includes the areas of load balancing, batch scheduling, workload prioritization, print/output spooling and appropriate resource sharing.

7) Service-level/availability management: Requires appropriate OS, subsystem and application instrumentation to provide status information on system, network and application resources. These tools must also tie into performance-, problem- and fault-monitoring tools. Availability management capabilities include OS/resource partitioning, clustering, clustered file systems, ability to perform preventive maintenance without incurring downtime, etc.

8) Operations management: The provisioning of console/network monitoring, production support, and general monitoring of workloads as they are processed.

9) Performance/capacity management: Tools include performance collection software, automated analysis of performance data in relation to service levels, intelligent (rules-based) response to abnormal situations, and a capacity planning model or tool to project future requirements.

10) Infrastructure development management: Development of an organizational core competency around infrastructure problems. Includes many of the other nine areas, with emphasis on middleware and application management.

INTEGRATION

Integration is the most critical success factor for the future enterprise data center. This issue is synonymous with the issue of standards; the middleware components that bring about integration are only as effective as they are pervasive. Individual vendor initiatives to extend "standard" middleware often render them non-standard.

It will require key vendor initiatives based on strong alliances to "glue" these disparate integration technologies together. These technologies include platform-based architectures (e.g., non-uniform memory access [NUMA], S/390 Parallel Sysplex), data/storage architectures and middleware such as ORBs, SQL, gateways, distributed transaction monitors and messaging.

Looking out to 2000/01, META Group believes S/390 (with Parallel Sysplex) and NUMA (with Intel) will pervade most enterprise platforms (HP, Sun and IBM will have NUMA-based platforms in this time frame) as the means of tying small groups of processors into larger processor clusters. NUMA offers the advantage of symmetric multiprocessing (SMP) technology with theoretical massively parallel processing (MPP) scalability.

While SMP clustering is generally limited to 16-32 processors, NUMA servers will soon handle up to 252 processors. The advantages of NUMA translate into higher availability, reduced cost and the ability to consolidate workloads into fewer servers, thus minimizing management overhead and providing economies of scale.

Data/storage architectures are required to provide common access to data (regardless of platform, data structure, etc.) and a common means of providing backup/recovery, archival, HSM and database/data warehouse interoperability. While vendors such as EMC (in partnership with database and platform vendors) will lead the way in providing enabling technologies, IT must adopt the appropriate support tools and develop systems and procedures to ensure maximum availability, service (speed of access) and data integrity. The goal for IT: to create an integrated storage hierarchy that provides trade-offs between cost and service.

In the area of security, the purpose of DCE was to provide integration for network authentication of users through Kerberos, DES encryption and database single sign-on. By 1998, however, Netscape and Microsoft will have driven reasonably effective encryption and authentication mechanisms (via a successor to Secure Sockets Layer) into their markets. By 1999, those technologies (based on RSA and X.509) and LDAP will deliver enterprise directory capabilities. By 2001, this technology set, in a form called Public Key Infrastructure (PKI), will likely supersede DCE for authentication and, by 2003, for authorization.

In the context of ORBs, the Common Object Request Broker (CORBA) architecture is

Enterprise Data Center Scale Requirements

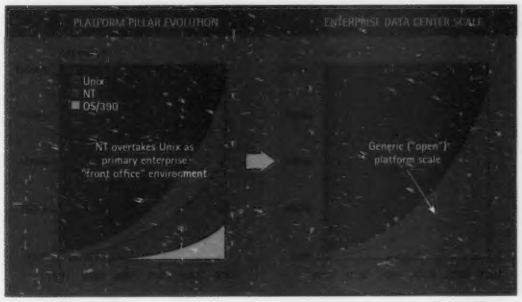


FIGURE 1

Source: META Group

Developers creating custom software for multi-platform distribution at large corporate sites are starting to seriously consider CORBA.

key. Lack of interoperability has limited CORBA's usefulness as a standard for distributing objects (i.e., its ability to act as an object traffic cop) but implementations such as Universal Networked Objects have helped. Developers creating custom software for multi-platform distribution at large corporate sites are starting to seriously consider CORBA. OLE/DCOM, by virtue of Microsoft's continued push, will become a major consideration.

Political and technical obstacles will continue to prevent a universal SQL middleware product.

SQL interfaces/middleware are a difficult proposition for many users. Most client/server implementations use the merchant database vendors' products (e.g., Oracle SQL*Net, Sybase OpenClient). SQL will remain an important middleware standard, with the merchant RDBMS vendors supplying the bulk of the technology.

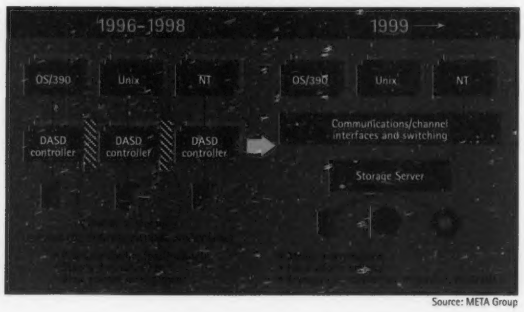
While greater interoperability will always be a goal, political and technical obstacles will continue to prevent a universal SQL middleware product. And as data-driven IT architectures include more disparate data sources (including legacy databases) and performance requirements, users will have to move beyond SQL middleware.

In terms of third-party SQL interfaces and gateways, Microsoft's ODBC, Information Builders' EDA/SQL, Oracle's SQL*Connect and Sybase's OmniSQL provide database independence for applications with limited performance requirements. The best use of this technology is to enable client access to data warehouses (i.e., most DSS tools support ODBC on Windows), or to support batch extracts and transfers from one database to another. SQL gateways are also marketed as enabling a "SQL view" of non-relational data (VSAM, IMS, IDMS, RMS), but the usefulness of these products is restricted by the data schema changes in most legacy databases.

Distributed transaction monitors (e.g., Transarc, Tuxedo) are another enabler in IT's arsenal. CICS emulators on Unix (i.e., Unikix and VIsystems) enable cut-and-paste downsizing of CICS online systems, and support open-CICS to mainframe-CICS intersystem communications. But META Group does not project long-

Heterogeneous Storage Evolution

FIGURE 2



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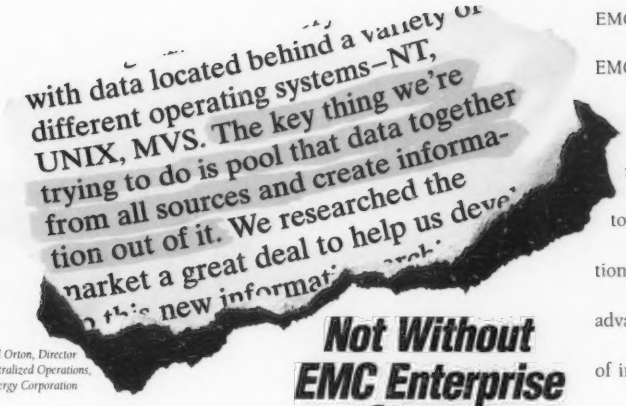

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term success, due to user reluctance to load a full-scale CICS interface (API) on PCs.

In the longer term, message-passing and queuing middleware offers the most promise as users write more complex GUI-based applications. The non-blocking asynchronous model of this technology best fits the event-driven GUI programming paradigm. We believe IBM's MQI (message queuing interface) will be the messaging standard, with MQSeries and MQ 3-Tier deployment slowly increasing.

SCALABLE PLATFORMS

Even the most talented IT architects have been unable to project the evolution of hardware and software platforms. Nor have they been able to predict server/network application requirements, even within the first year. IT groups must adopt platforms that scale over at least a 5-year window to avoid costly conversions, migrations and disruptions to business. Since application forecasts (and longevity) often exceed plans, the real need is to "bullet-proof" enterprise technologies by providing a growth path (e.g., porting or normal scale increments) that will support the normal 5-10 year life for applications (see Fig. 2).

For most enterprise applications (i.e., more than 500 users and 100GB of data), data centers will opt for OS/390 and high-end Unix until at least the second half of 1999, when NT Enterprise begins to offer new scale options.

By 2000/01, we foresee Unix consolidation around Sun Solaris, AIX and HP-UX, creating challenges for vendors and users. While we view S/390 as the most scalable hardware platform with its potential for 32x10-way (uniprocessors now at 62 MIPS, scaling to 100+ MIPS by 2000) configurations, Intel's IA-64 Merced architecture will significantly increase Unix/NT scale by 1999.

Meanwhile, users continue to back off from shared nothing architectures (i.e., MPP) in favor of SMP+ systems such as NUMA. We also believe that NUMA-based clustering and the continued trend toward NT will shift ISV focus and overall market perception to Wintel, including both Unix and NT permutations.

Sequent recently demonstrated its ability to provide Unix and NT partitions in its NUMA-Q 2000 server. This prototype, to ship in 1998, also highlights the capability of Oracle Parallel Server to scale across multiple nodes. Virtual Interface Architecture, an emerging high-speed communications interface, should provide better performance and scalability (versus distributed message passing, or DMP) in such configurations. NUMA-Q 2000, however, represents the first NT-capable platform that can be configured in a distributed/DMP format, a large SMP system, or both simultaneously. This approach promises NT-scale investment protection and a migration path to NT.

NUMA technology represents a good compromise between traditional SMP and MPP architectures. Its key concept is the combining of "near" and "far" processor and memory resources (e.g., on a local node or not), transparently extending the SMP shared resource programming model. The I/O subsystem is based on 100MB/sec fiber channel interfaces, including fiber channel bridges accommodating SCSI and legacy peripheral support. Sequent's NUMA-Q 2000 is the first Intel-based NUMA system; we expect Sequent to establish OEM deals with other systems vendors to accelerate their transition to NUMA.

DATABASES/STORAGE

As Unix database servers grow (30-300 GB+), and as OS/390 data is increasingly accessed across disparate platforms, users must develop storage architectures to address issues of backup/restore, HSM, cross-platform access to tape

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NUMA-based clustering and the continued trend toward NT will shift ISV focus and overall market perception to Wintel.

devices and automated tape libraries. The pressing area of backup/recovery operations is driving early efforts, with emphasis on the integration of DBMSs with tape systems.

Despite rapid product evolution, led by vendors such as IBM and EMC, users will continually have to overcome technology limitations and lack of media and access method standardization through at least 2000. In 1997/98, users will combine automated storage hardware with more comprehensive network, Unix, OS/390 and storage management software/firmware implementations (see Fig. 3).

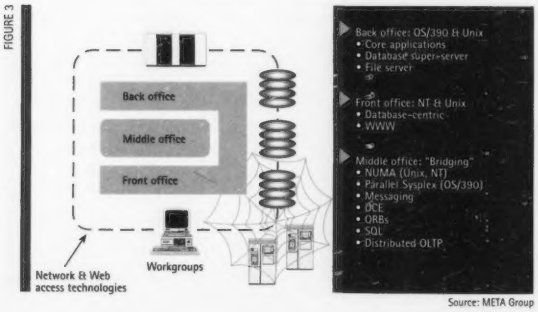
NUMA technology represents a good compromise between traditional SMP and MPP architectures.

As the lines between online, offline and cache storage overlap, storage systems leveraged by enterprise HSM will enable distributed storage I/O subsystems to merge with S/390 subsystems in the enterprise data center. Linking disparate I/O subsystems will enable single-point application access, the ability to join data from geographically dispersed and disparate data structures, and provide a foundation for common middleware and software transport functions. Enterprise I/O subsystem building blocks include serial and fiber connectivity technologies, multi-host connectivity and HSM software.

Storage subsystems are rapidly evolving. Sustained data transfer rates of 500MB/second are already available, and terabyte/second rates are projected in the next two years. Storage management ISVs such as BMC, Boole & Babbage, Compuware and Sterling Software will make product acquisitions to support these newer technologies through 1998, with hardware vendors such as EMC and IBM providing built-in storage management functionality and connections to their respective software-based capabilities.

Uniting Enterprise Data Center Technologies

FIGURE 3



Source: META Group

ASSET MANAGEMENT

Enterprise asset management (EAM) is defined as the establishment of core competencies around the other nine principles. In addition to providing tools and procedures to support various EAM disciplines (e.g., configuration management), tomorrow's data center must be built on a foundation of tech-

nology that is leveraged (e.g., two to three major vendors, with a focus on technologies that maximize synergy and provide economies of scale), while providing scale and manageability. These strategic vendors must also provide technology that lends itself to achieving investment protection, longevity, financial benefit and a toolkit to enable EAM rigor.

EAM tools have emerged from systems vendors, ISVs, help desk vendors, LAN management vendors, service vendors and those with a specific asset focus. These tools all enable different tasks and disciplines, ranging from inventory collection and reporting to higher-end analysis of the asset portfolio. While each EAM constituency prioritizes criteria differently, the key factors include asset clustering capabilities, data mobility (e.g., flexible import and export), and a solution to the lack of a primary key (i.e., unique identifier) for individual assets.

The CIO is the ultimate customer in need of asset management information. In evaluating tools, IT must balance functional vs. financial requirements. Solutions such as HP's AssetView, Asset Software International's AssetPro, Tangram Asset Insight, Comdisco's Class and Isogon's SoftAudit track the financial side of the house (maintenance and service costs) as well as much of the functional side (hardware/software configuration, inventory management, etc.). +

Bruce Allen is Vice President, Enterprise Data Center Strategies for META Group, Inc., an independent market assessment company that provides research, analysis, and advisory services regarding information technology developments and trends. For more information, visit www.metagroup.com.

BOTTOM LINE

Since most data center architectures are evolutionary, IT must provide support for at least three platform pillars: OS/390, Unix and NT. IT's challenge in the next 3-5 years is to develop an adaptive architecture, one that includes selecting key vendors with similar goals in providing adaptability and integration during this transition.

Database (and data) challenges will continue to plague IT and vendors. Vendors will lead the charge with architectural "bridges" such as Oracle's NCA and IBM's DB2/UDB strategy with associated middleware linkages. For IT, understanding the advantages of integration among hardware, software, database and network technologies will determine the appropriate vendor alignment and will help resolve corporate "how and where" hosting decisions for new and existing applications.

IBM will maintain its hold on the back office while reinventing OS/390 to provide some front- (and middle-) office capabilities. Microsoft continues its NT juggernaut; the NT/Merced platform will likely prevail as the standard bearer for network computing, despite Microsoft's inclination to focus on SMP and MPP with its Wolfpack offerings.

Meanwhile, little has been done to address middle office requirements (a notable exception is Sequent's NUMACentre 2000 initiative), leaving the main responsibility so far to IT organizations. In the next 3-5 years, IT must develop partnerships and alliances with vendors who can agree on common middleware and flexible architectures. . .which ensure bullet-proof enterprise capabilities for customers.

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THE FUTURE OF IS: ELITES AND FREE AGENTS

PETER G. W. KEEN

An IS revolution is well under way. The fundamentals — politics, careers, economics, resource capabilities, mission and relationships — are up for grabs. When the revolution is over, the information systems profession will resemble law firms more than it will today's IS departments.

In its roughly 40-year history, IS has never been hit at the very same time by such a combination of factors as now. The following are just a few of those factors:

Technical: Internet/intranets; Java; guaranteeing desktop integrity in complex networks; data warehouse integration; multimedia; electronic commerce; security.

Human resources: the year 2000 drain; the drop in computer science enrollments; the need for design rather than programming skills for multimedia and Internet applications; the supply/demand labor gap in so many areas, such as new-generation networking, SAP and data warehousing.

Economic: the cost of year 2000 fixes and their drain on development and infrastructure budgets; the continuing escalation of support costs.

Organizational: the impact of downsizing and outsourcing on IS confidence, morale and loyalty; the disenchantment with expectations that the chief information officer has to be some superhuman magician who can singlehandedly deliver competitive advantage and instantly meet all the needs of the business; the continuing problem of balancing central coordination of the information technology resource with decentralized use and decision-making at the root of the corporate politics of IS.

TODAY'S IMPLICATIONS

Individually, each of these factors signals land mines and signs that note "Here there be dragons" along the evolutionary path of IS. Together, they wipe out any clear path to the future; there will literally be a need for trailblazing. IS can't meander its way into such a complex and uncertain future.

However the revolution turns out, it will surely shift IS from technology to people. "High tech" is now, in reality, "high commodity." Every technology innovation generates its own commoditization. My own gleeful delight in ordering a laptop recently with a 14.1-in. screen and 80M bytes of RAM faded when I thought, "Yeah, but it's only 166 MHz." New in '97, passe in 1998. The same day, a friend who wires up conventions and such mobile events as this summer's Lollapalooza tour told me about how installing a network of "Tees" — T1 lines — in a half-day or so is basically blue-collar work for him. Small-scale World Wide Web site Internet and intranet development are close to being commodities, just two years after this was state-of-best-practice through the superb do-it-yourself software kits you can buy in any shopping mall.

But integrating the commodity components isn't a commodity and won't be for perhaps 40 more years. The real revolution is about people. Technology is now something you buy. Often, you're renting people with it, through systems integrators, consultancy firms and vendors. The future of IS rests on finding noncommodity people and contracting for technology. That will mean a smaller but far more effective, influential and focused new-style IS unit that will be the source of organizational advantage from IT. Its agenda will be innovation, service and spending time with its business customers instead of struggling to juggle all the now virtually impossible demands the traditional IS unit faces.

I certainly have no idea about the exact direction the IS revolution will take, but these are my best guesses: Success will come to IS organizations that give up the technology and the notion of IS as being mainly comprised of full-time personnel. Those organizations will instead build a very small, very elite central IS core, focused on integration; devolve all technology operations to autonomous specialist units organized around the commodities; and organize as advisers to the many groups — business units, technical teams and outside contractors — who will collaborate on technology-related decisions.

Give up the technology, please. It will be a handicap for IS in the revolution. Rent the technology skills, and rent the best you can afford because you'll need them. Identify the technology decisions for your firm. Become expert about them, and become advisers to the people who will make them. Build a group of 20 to 40 people who are stars in business/technology integration and telecommunications/database/computer integration.

Accept that the IS profession is moving to become very much like the legal field. A law firm has a small core of corporate lawyers but very few "staff." Law is a profession composed of independents, specialists, small and large firms that corporations draw on through their core in-house group. That's what the next generation of IS will be: independents, specialists and contractors.

So forget about recruiting and retaining. Learn how to coordinate, integrate, contract and advise. And IS professionals, set yourself up as lawyers do. Focus your skills. Specialize. Keep up to date. Be a true "professional." □

Keen's address is www.peterkeen.com. *The third of his books published this year by the Harvard Business School Press,* Online Profits: A Manager's Guide to Electronic Commerce, *was released Oct. 1.*

f.y.i.

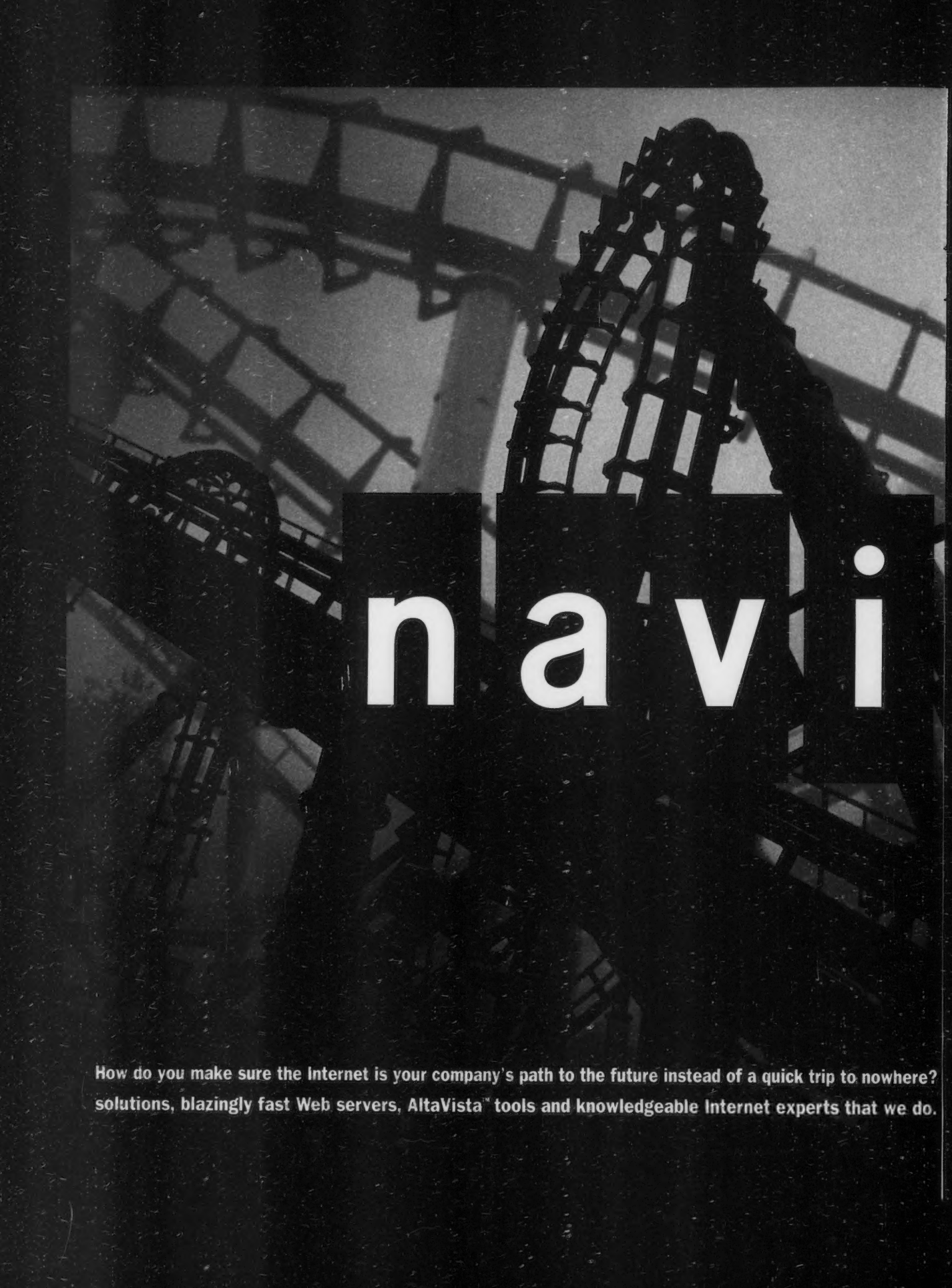
Going right to the top

If you have a chief information officer who reports directly to the chairman, CEO or chief operating officer, that could be a sign your IS department has risen in status since the 1980s.

A survey conducted this past summer by a New York executive search firm, John J. Davis & Associates, Inc., found that nearly half of more than 300 top-level information technology executives at Fortune 1,000 firms report to the top level. That top level includes president and chairman, says John Simon, managing director of Davis & Associates. Only 22% report to the chief financial officer; the rest answer to a variety of other offices.

"Ten years ago, the CIO was regarded solely as a provider of a support function," Simon says. "Since then, more companies recognize the strategic business role the CIO can play, and both the reporting lines and job specs have changed accordingly."

Simon doesn't have any hard numbers from the '80s to measure the change in stature. That's because such questions weren't asked then, he says. But changes in the reporting relationships in job specifications — along with comments in similar surveys conducted in the past few years — led the firm to suspect a trend, he says. □



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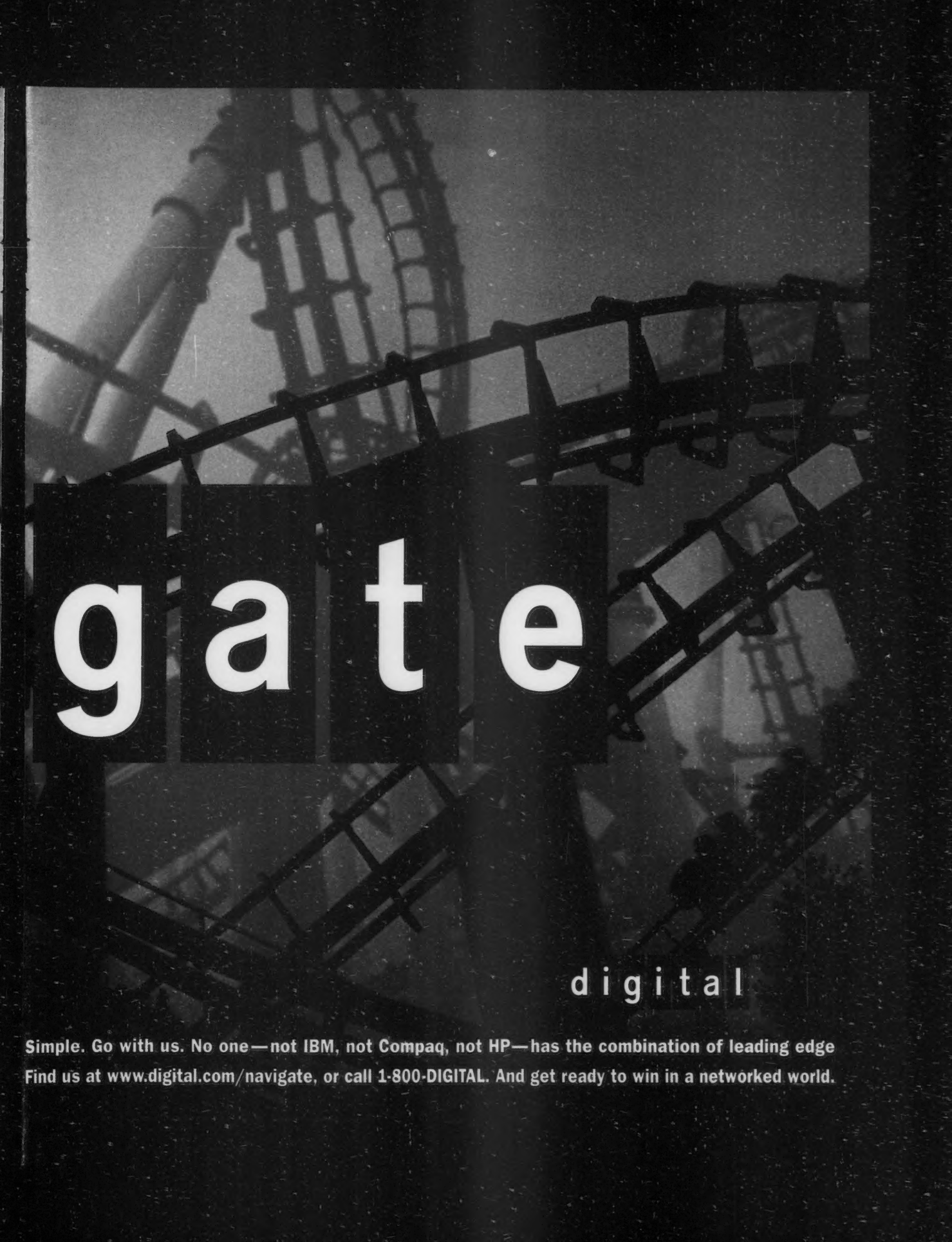
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Buyer's Guide

Gartner, Meta Group, Giga and Forrester have emerged as leaders in broad-based IT advisory services

GURUS FOR HIRE

By Amy Malloy

When you spend $10 million to implement a new technology, it may be worth another $30,000 to ensure that you're investing in the right technology. Thus the inception of information technology market research and advisory firms. These organizations provide IT leaders some assurance in the high price/high risk world of computing. Their analysts can help you choose the right product. Also, in a worst-case scenario, if a technology choice blows up in your face, at least you can say an analyst recommended it.

Corporations rely on IT research firms for advice on a broad range of technological products, architectures and approaches. Investment firm analysts who follow the market most commonly name four firms as the leading suppliers of broad-based IT data to the corporate world: Forrester Research, Inc., Giga Information Group, Gartner Group, Inc. and Meta Group, Inc. There are dozens of other organizations that provide research in more specific technology areas and many groups that focus on systems integration or track market trends for IT vendors.

"The strength for me as an IS manager is that I have someplace I can call and get some instant opinions on either a product or a certain functionality, as opposed to looking through print media or scraping the Internet."

– David Creedon, CIBA Specialty Chemicals

Users and analysts cite time-savings as one of the biggest benefits of subscribing to one of these firms. "The strength for me as an IS manager is that I have someplace I can call and get some instant opinions on either a product or a certain functionality, as opposed to looking through print media or scraping the Internet," says David Creedon, manager of business systems integration at CIBA Specialty Chemicals Corp. in Tarrytown, N.Y.

That time-savings translates into cost justification for many companies that subscribe to market research firm services. After evaluating the cost of devoting in-house information systems staff members to researching a particular product category, Nine West Group in White Plains, N.Y., determined that an IT market research firm is less expensive, says Gene Alvarez, a data administrator at Nine West.

It isn't unusual for companies to rely on more than one market research firm for advice about major product buys. "If you are going to spend $10 million on a certain technology, you better believe that you want to have a second opinion," says Ullas Naik, a vice president at First Albany Corp. in Boston.

Technology research firms aren't cheap, but most clients don't find them cost-prohibitive, say analysts who track those firms. Given the size of IT expenditures, subscribers are getting a low-cost/high-value-added product from the research firms, says Keith Gay, vice president at NationsBanc Montgomery Securities, Inc. in San Francisco.

For most organizations, enlisting the services of a research firm is just another step in the evaluation process. Alvarez equates using an IT market research firm with hiring an engineer to examine a home before you buy it.

A user company must decide on which research firm to use based on its own organizational structure. The research firms aren't the same, says Sara Graziano, an IT consultant at Entergy Corp. in New Orleans, which has used Meta, Forrester and Gartner. "As far as responsiveness, I think they are equal, but they have different focuses," she says. For example, Graziano says Gartner's detailed research differs

from Forrester's broad, forward-thinking perspective on the market.

Clients of the research firms are unlikely to say that one of the firms offers better research or employs smarter analysts. The firms win over customers by quality of service, meaning that they provide answers in a timely manner and maintain contact with clients, Gay says.

Analysts who track this market and clients who subscribe to the research firms say specific characteristics distinguish firms from one another. Gartner, the largest of the four, stands out for the breadth and depth of its research and the firm's size. Its revenue was close to $400 million last year. The other firms top off in the tens of millions.

A Gartner report provides many details, says Sherri Wolf, an analyst at Adams, Harkness & Hill, Inc. in Boston. Because of Gartner's size and breadth, you usually can find what you need with them, she says.

Research firms take different approaches. Forrester's George Colony says his company focuses on the big picture

Forrester targets the CEOs and chief information officers of its user companies, Wolf says. Its analysts tend to write shorter reports that talk about key issues and players and market direction, she says.

Forrester presents a top-level view, which is good for people who want to keep abreast of technological innovations without learning the details of a particular IT implementation, Naik says.

Meta says its ratio of 50 clients to one analyst is its biggest selling point. That's 50 clients per analyst in one service technology area. Meta encourages clients to telephone its analysts. "It's the high-touch approach," Wolf says.

Giga labels itself as a third-generation provider — a knowledge integrator. Giga has an online, interactive business model, Naik says.

Financial analysts expect these advisory firms to continue to grow. They also predict consolidation. Product lines are similar, so a merger would cut costs, Gay says.

Such a merger could present difficulties in the blending of cultures, Naik says. Each market research firm has a unique culture and its own set of egos, he says.

Analysts also predict that these organizations will expand through diversification. In addition to offering new services in related areas, they may explore areas that don't typify their core business. □

Malloy is Computerworld*'s associate editor, Buyer's Guide.*

Gartner Group, Inc.

Gartner Group is nearly 10 times the size of its competitors in number of analysts and revenue, according to financial analysts. That makes it possible for Gartner to cover the IT industry broadly and deeply.

Gartner, in Stamford, Conn., and Santa Clara, Calif., has three main businesses, which it calls its advisory, measurement and learning businesses.

The advisory business consists of research advisory services; the acquired research firms Datapro Information Services Group, Inc. and Dataquest; interactive journals such as *Business Technology Journal*, which contains IT information for non-IT professionals, and the *Information Technology Journal*, which was designed for IT professionals. The journals provide information on a daily basis. Clients also can purchase a set of decision models called decision drivers. "The advisory services is the foundation of Gartner Group and how this company was started," says John Neeson, senior vice president of worldwide marketing at Gartner.

The measurement business operates as Real Decisions and provides benchmarking and best-practice advice to clients. The learning business offers services that range from helping clients manage core competencies to technology-based training.

About 80% of Gartner's clients are IT user organizations. They range in size from $100 million companies to Fortune 50 companies. The remaining 20% of clients are vendors.

About half of Gartner's 435 analysts fit into the research and advisory services. They average 15 years of experience in the IT industry. Analysts often have held the title of vice president in earlier jobs, says Bill Clifford, chief operating officer and president of Gartner Group Research.

When Gartner says it covers a technology such as telecommunications, Clifford says, it devotes dozens of analysts to that area. "We really don't see any competition that can meet us in terms of the breadth of our product offering," Clifford says.

Under the advisory services, clients can purchase 58 individual services, covering a range of technology subjects, Clifford says. Clients subscribing to a service receive telephone access to analysts, research in the medium they choose and a monthly publication that contains that month's top 10 pieces of research. Gartner provides a biweekly, six-piece research set for each service area. Most clients purchase a Gartner journal to get a daily feed of information.

Clients also can buy 120 Dataquest titles, 25 Real Decision benchmarking offerings, 51 Datapro services and 400 CBT Group PLC titles that Gartner sells. A Gartner Group research advisory service costs on average between $10,000 and $18,000 per year.

Gartner says it tries to answer questions with "strategic planning assumptions." To do this, analysts come up with a probability to express, for example, what Gartner thinks is the likelihood a predicted result will occur. "We attach a probability to what we believe," he says.

As for future growth, Gartner plans to continue its expansion and diversification within the IT marketplace. "Look for us to stay right in the middle of the IT business, playing on our two competencies of research and distribution," Clifford says. □

Revenue: $394.7 million 1996

Net income: $50.5 million 1996

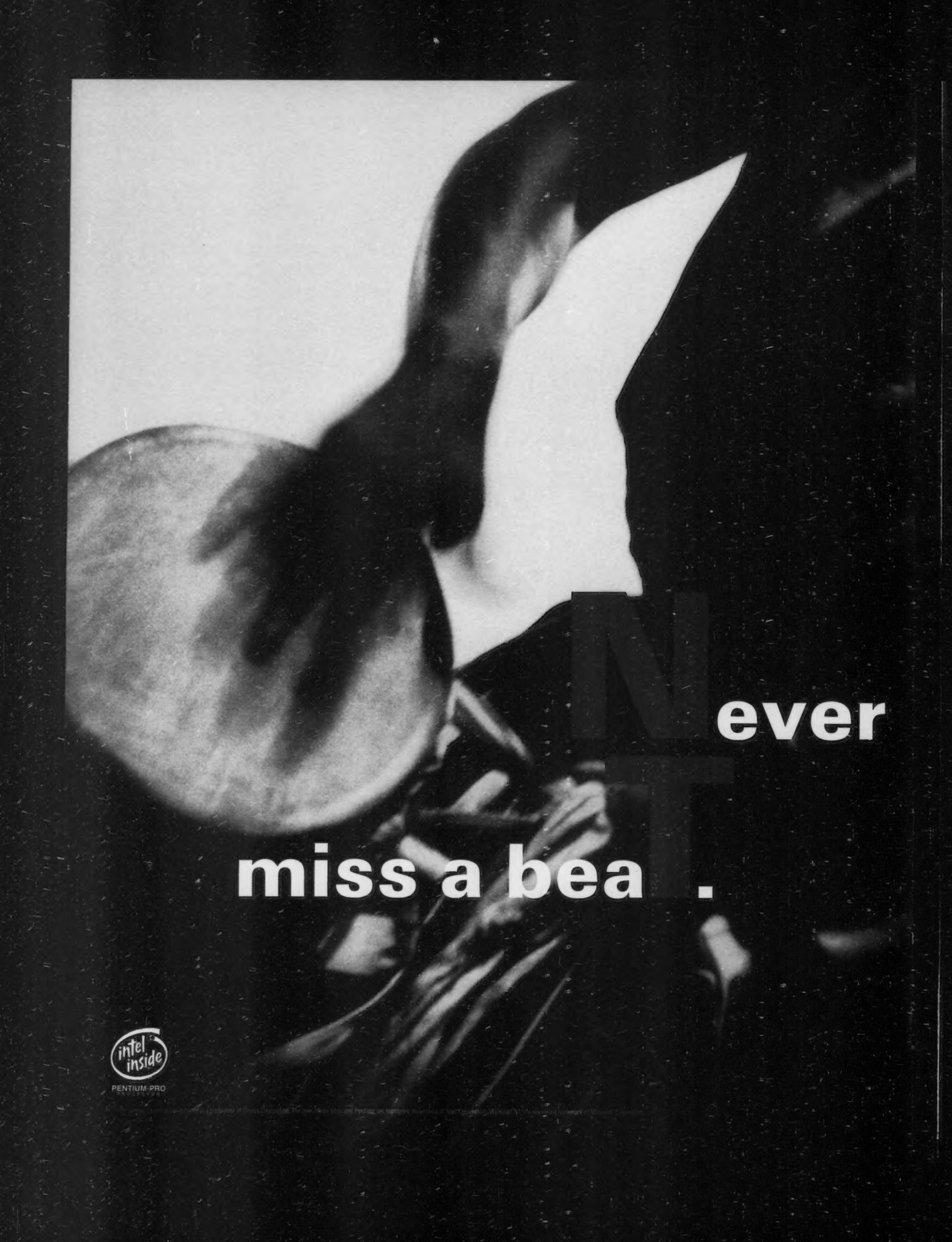
Number of employees: 2,200 worldwide

Number of analysts: 435 (including Dataquest, Datapro and Gartner Advisory)

Number of clients: 8,300

Web site: www.gartner.com

Gurus for hire, page 95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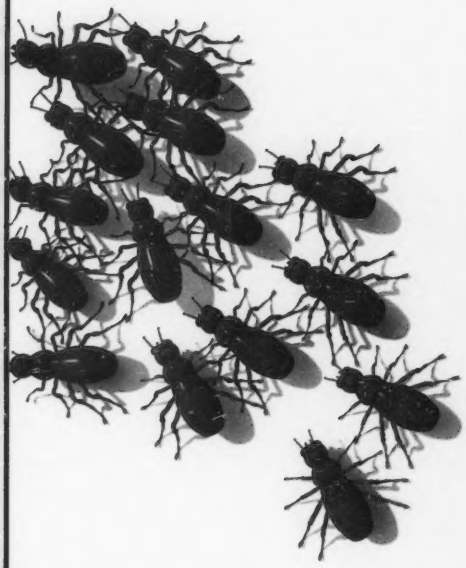

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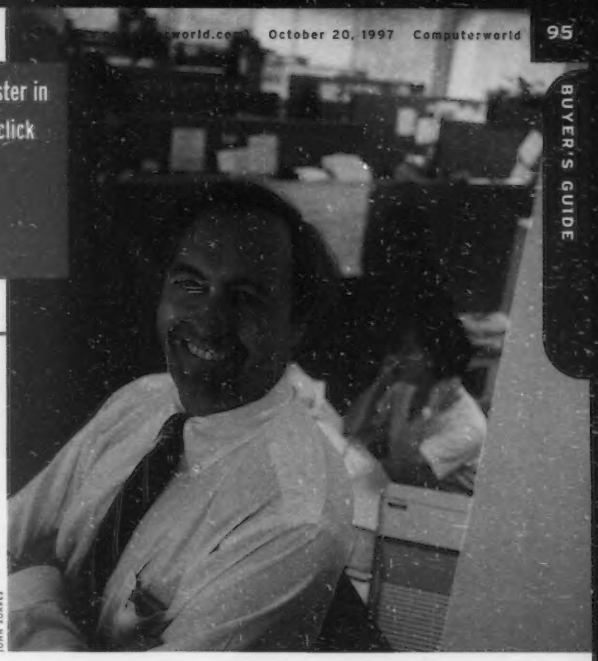
"My goal is that Forrester in the future will be one click away for all clients."
– George Colony, Forrester Research


JOHN SOARES

Forrester Research, Inc.

Forrester started as a small company boutique in 1983 and has evolved into a research firm that focuses on the concerns of CIOs and their staffs. George Colony, Forrester's president, says the firm isn't a "bit-twiddler." The user trying to decide between buying disk drive A or disk drive B will want to go somewhere else for advice.

Forrester estimates that 90% of its clients also are Gartner clients. It makes sense that you would buy Gartner for technology assessment and Forrester to understand how to apply the technology for your business, Colony says.

Forrester divides its business into three areas: New Media, Information Technology and Senior Management or Leadership. Half of Forrester's business is its Information Technology business, which includes four services: computing strategies, network strategies, packaged application strategies and telecommunications strategies. The other half of Forrester is New Media (40% of the business) and Leadership.

Forrester claims to be a leader in New Media, and it offers six strategy services in that area. The services focus on subjects such as business trade and technology, entertainment and technology, and people and technology. Leadership Strategies is research for senior management; it focuses on the relationship among technology, revenue and profit.

Analysts at Forrester have seven to 15 years of experience in the IT industry. Colony describes his analysts as original thinkers who are capable of looking at a wide range of technology and economic factors. Analysts must be willing to make a counterintuitive call about the IT industry — to say the industry is going one way when everyone else says it's going in another direction, he says. Forrester likes its analysts to maintain an interest in politics, society, economics and the arts.

Each analyst is expected to delve deeply into one or two areas of technology, but the analyst must also have a general understanding of the industry as a whole, Colony says.

Forrester names the stability of its analyst staff as the top strength of the company. And Colony says Forrester makes a point not to associate with Wall Street or conduct deals with vendors so it can keep the focus on the technology users.

Forrester groups its analysts under its 12 services. Each service releases a 16-page report each month and a two-page research brief roughly twice per month.

Colony says Forrester focuses on the application of the technology and how it will impact profitability, cost and market share, rather than providing a blow-by-blow discussion of whether router X is better than router Z.

Research typically goes to clients from the 2,000 largest companies in the world. The minimum purchase configuration is three subject services for 20 users at a cost of $30,000 per year. For that, subscribers get access to analysts and research. The Strategy Review Program adds an additional $13,000, and the Partners Program costs $38,500.

Actual contact with clients, which is available under all services, is 30% of Forrester's revenue. Those are interactive clients, and they have unlimited access to Forrester analysts. "We have an entire group called Navigation, which makes sure that the client talks to our analysts," Colony says. "We want them to use our time," he says. Syndicated research generates the remaining revenue.

Forrester claims to be the first company of its type to deliver research via the Internet, and the company places a strong emphasis on its electronic products. "My goal is that Forrester in the future will be one click away for all clients. In the future, it is going to be more interactive, more personalized and more immersive," Colony says.

Clients also can get Personal Forrester, in which they can customize a list of their topics of interest. Every time the client goes to Forrester's site, the current updates are available.

Future growth for Forrester will revolve around global expansion and increased service offerings. The firm, which has a research center in Cambridge, Mass., plans to open a center in Europe next year. Forrester will focus more on its events business by increasing the number of events from three to six next year. □

Revenue: $24.9 million 1996
Net income: $2.8 million 1996
Number of employees: 202
Number of analysts: 63
Number of clients: Not available
Web site: www.forrester.com

Meta Group, Inc.

Meta Group tries to keep in close contact with its clients by keeping a low client-to-analyst ratio. The firm says that emphasis on personal interaction is its No. 1. differentiator from its competition.

The interaction with analysts gives clients in-context analysis of their particular business environment, says Dale Kutnick, president. "We are not just selling information; we are selling decisions," Kutnick says.

Founded by Kutnick and Marc Butlein in 1989, Meta Group, in Stamford, Conn., sees Gartner as its primary competition and Giga and Forrester as secondary competition.

"People may call us for information, but they are not going to get any major advantage by talking to us vs. Gartner or Giga. The advantage they are going to get is only when they come to us for in-context analysis," Kutnick says.

With that focus on client/analyst interaction, Meta requires its analysts to have a keen interest in business and IT, excellent verbal and written communication skills, self-motivation and a sense of urgency, according to Kutnick.

Analysts must be able to perform second- and third-level derivative analysis — the ability to predict what the possible occurrence of a particular event will mean to the market.

The research firm also says it differentiates itself by the consistency of its analysis across its seven core services, which cover a broad range of IT such as application delivery strategies, workgroup computing strategies and enterprise data center strategies, Kutnick says.

All research is reviewed by the research director before clients view it in their choice of formats: electronic, CD-ROM, Lotus Notes mail and paper.

All written products are available to clients via the World Wide Web. Later this year, Meta will offer "push" technology for more customized information.

In addition to its seven core services, Meta sells six other services that focus on areas such as vertical industries, benchmarking and a CIO service.

Meta has three primary product types: continuous services, consulting and publications. Continuous ser-

Gurus for hire, page 98

Meta Group tries to keep in close contact with its clients by keeping a low client-to-analyst ratio. The firm says that emphasis on personal interaction is its No. 1. differentiator from its competition.

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1

CLC 320

2

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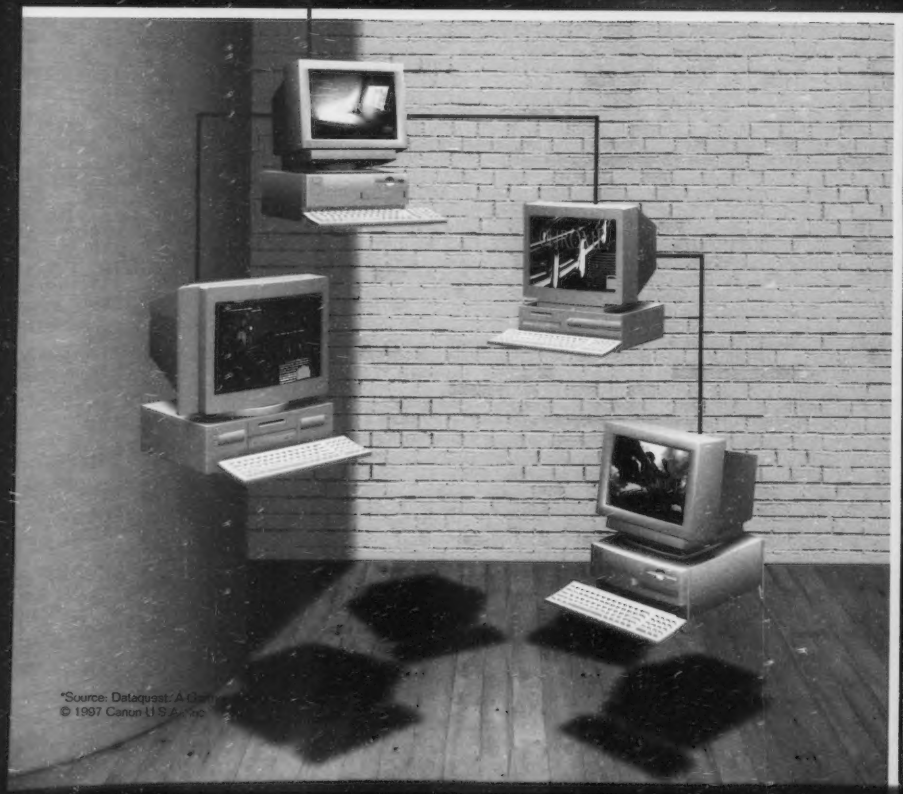

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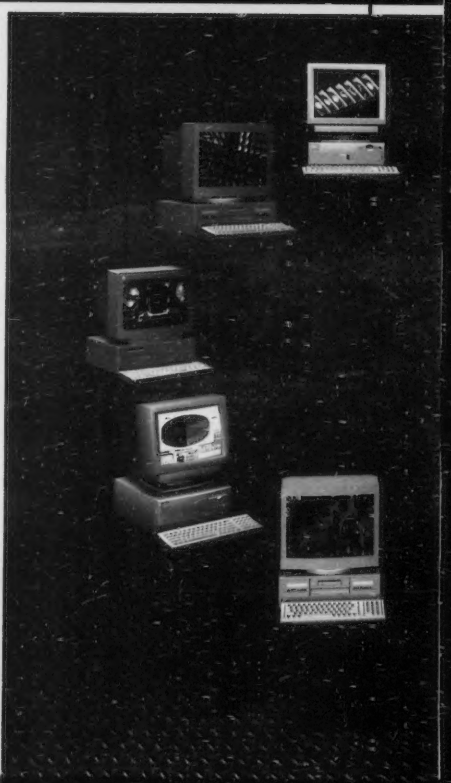

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GURUS HIRE

CONTINUED FROM PAGE 95

Meta Group, Inc.

vices is a bundle of products that includes written material, conferences, teleconferences, a review of a company's strategic plan, half-day briefing, Meta facts and access to analysts. Continuous services accounts for 80% of Meta's business. Consulting and publications make up the rest of the business, Kutnick says.

Publications, such as reports or newsletters on a hot topic area, represent the smallest percentage, but it is the fastest-growing area at Meta.

Companies that subscribe to one of Meta's continuous services will end up spending $22,000 to $25,000 yearly for one of the 13 services. A publication will cost from $500 to a few thousand dollars, Kutnick says.

Meta caters to both domestic and international businesses. The typical client is a large global organization that spends $30 million to $60 million on IT.□

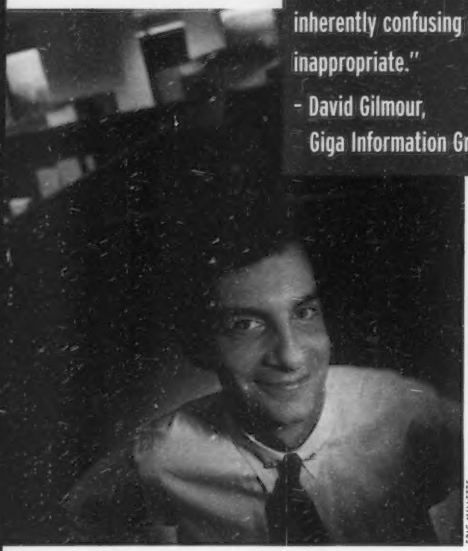
Revenue: $30.8 million 1996
Net income: $3.6 million 1996
Number of employees: 245
Number of analysts: 105
Number of clients: 1,300-plus
Web site: www.metagroup.com

Giga Information Group

Giga Information Group is the latest venture of Gideon Gartner, founder of Gartner Group. Giga, in Cambridge, Mass., differentiates itself from other groups by offering one broad service rather than the technology-specific services of its competitors.

"In today's world, IT issues are so interrelated that trying to divide them into boundaries is inherently confusing and inappropriate," says David Gilmour, co-founder and chief research officer. Giga integrates all technology subject areas to ensure that its research materials present a consistent view, Gilmour says. And clients don't have to choose among services.

"IT issues are so interrelated that trying to divide them into boundaries is inherently confusing and inappropriate."
- David Gilmour, Giga Information Group



ERIC MILLETTE

Giga was formed through the consolidation of several smaller companies, beginning in 1994.

The firm sees itself as coexisting, rather than competing, with firms such as Gartner and Meta. "We feel that because Giga was designed from the ground up with a brand-new research process and focused on electronic personalization and delivery, that we are really in a class by ourselves in terms of a knowledge provider," Gilmour says. Gartner provides advice and research to IT organizations, but Gilmour says Giga acts as an intermediary by synthesizing research as well as providing advice.

Giga's business model provides that all clients get the same single advisory service that covers all topics. They pay a premium, however, for contact with analysts.

There are three types of membership to Giga: seatholder, user and member. A Giga seatholder gets access to all written research and personalized search agents. The user receives the same service as the seatholder plus access to Dow Jones News Service and Information Access Corp. The Giga member gets all of the above, full access to analysts and additional services.

Typical yearly prices are: $12,000 for a single member subscription, $1,000 for a user subscription and $200 for a seatholder subscription. Companies can also purchase combinations, such as a $36,000 package that includes two member and 10 user licenses.

Giga provides two main research products: Planning Assumptions and CQAs.

Planning Assumptions are four-page research notes issued on dozens of topics each month. They are highly structured documents that include a summarization of Giga's position and advice, an alternative view and explanations of how Giga reached its recommendations. "We offer an alternative view in every Planning Assumption. This is our way of meeting two paradoxical objectives: One is to be clear about what we believe, but the other is to illuminate the entire territory of the debate," Gilmour says.

Giga also produces hundreds of shorter forms of research called CQAs, which stands for catalyst, question and answer. A catalyst tends to be based on a user inquiry, an industry event or the creative thinking of an analyst. Giga complements its advisory services by offering a practitioner perspective through ExperNet, an outside network of more than 600 independent IT experts. Although customers can call them, the independent experts don't fulfill the analyst role.

The firm also offers Relevance Services, primary research bundled with custom consulting. "I think you'll see us offering more customized, higher-value options that will bring us more intimately into our client organization," Gilmour says.

Gilmour also sees the Internet as an opportunity for unique growth. "Over time, because of the power of the Internet, we see the process of writing research, reviewing research internally and with clients, publishing research, building client and community interaction around research, plus integrating with third-party information — all as converging into one and the same process," Gilmour says.

The research is most relevant to upper-level IT executives, and increasingly non-IT executives, in companies with revenue of $250 million and above up to the Fortune 10, Gilmour says.□

Revenue: $16.9 million (annualized revenue as of August 1997)
Net income: Not available (private company)
Number of employees: 290
Number of analysts: 38
Number of clients: 515
Web site: www.gigaweb.com

Editor's Note

Where should you go for IT consulting and analysis? Simple: It depends.

In looking at leading IT consulting firms, *Computerworld* focused on large consultancies that primarily provide corporate IT decision-makers with information on a broad range of technologies. They were chosen with the help of financial analysts who follow that sector.

Yet the four firms represent the upper echelon of just one of many types of computer-related consulting and analysis companies. Some of the larger firms, such as International Data Corp. (like *Computerworld*, owned by International Data Group) and Dataquest (owned by Gartner), may have clients in user organizations, but they focus more on identifying market trends and tracking market shares to advise computer makers, software companies and other clients. They also cover a range of technologies and issues.

Smaller firms are likely to concentrate on a handful of technologies — such as object technology or printing — or a vertical market, while serving a mix of user and industry clients. They track and evaluate vendor product offerings and strategies, providing insight to IT clients. At the same time, they analyze IT needs and challenges and advise vendors on how to best meet those needs.

Still, other analysts serve the investment community. They concentrate on whether a vendor's strategy will return profit to investors.

This feature package also didn't deal with the thousands of consulting companies that do hands-on consulting and systems integration. — *James M. Connolly*

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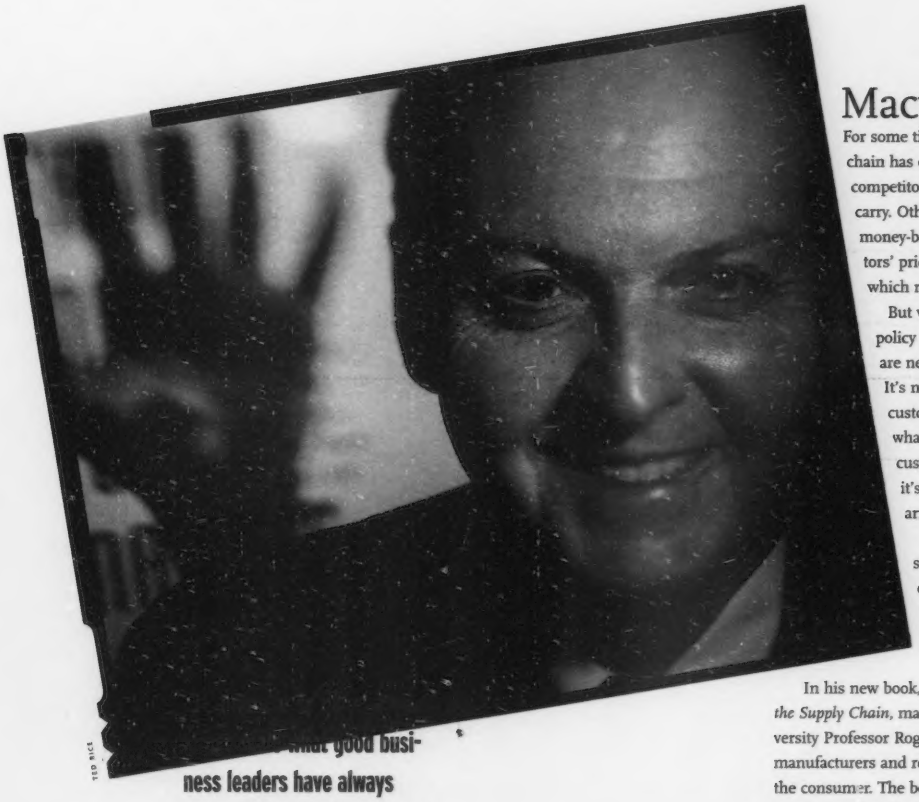
In Depth

REINVENTING *the* SUPPLYCHAIN

Roger Blackwell knows how the best companies use IT to anticipate customer demand. He told us their secrets – and how you can apply them



TED NICE

...what good business leaders have always done: listen to the consumer."

– Roger Blackwell

Macy's started it.

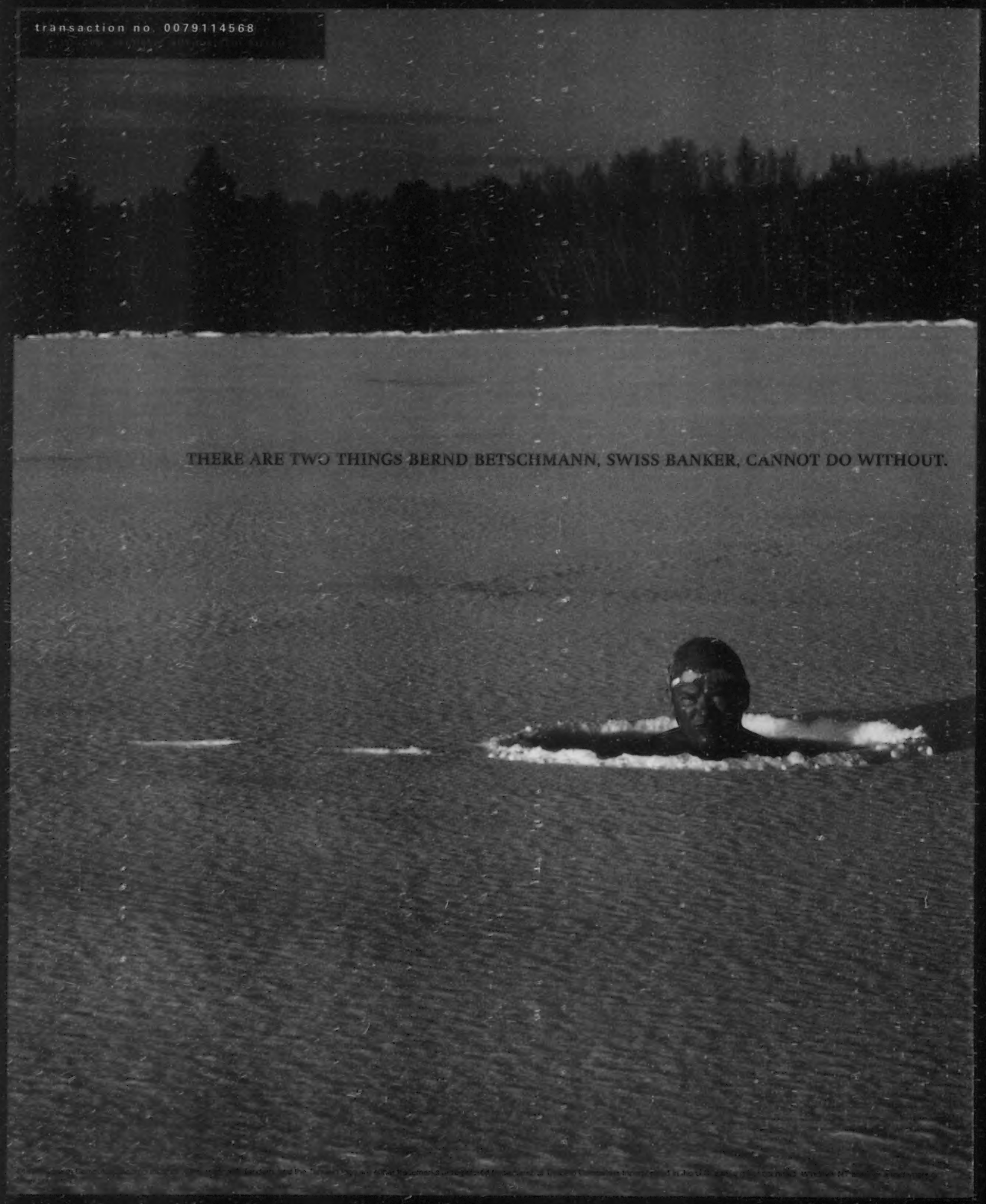
For some time now, the department store chain has cheerfully referred customers to competitors for products Macy's doesn't carry. Other retailers then started to offer money-back guarantees and match competitors' prices. Customer service is the field on which retail wars are won or lost.

But while a no-questions-asked return policy is well and good, smart weapons are needed in today's savage marketplace. It's no longer enough to locate what the customer wants; you need to figure out what the customer wants before the customer asks — and make sure it's on the shelf when the customer arrives.

Increasingly, such tasks fall on the shoulders of information systems departments. Technology is becoming the key link for manufacturers and retailers to tightly integrate the demand and supply chains.

In his new book, *From Mind to Market: Reinventing the Supply Chain*, marketing guru and Ohio State University Professor Roger D. Blackwell studies the ways manufacturers and retailers create tight bonds to reach the consumer. The book uses a case-study approach to examine how the top guns in the business world are making their millions and how your company can apply their techniques. In a recent interview with *Computerworld*'s Randy Weston, Blackwell discussed IT's role.

Reinventing the supply chain, page 105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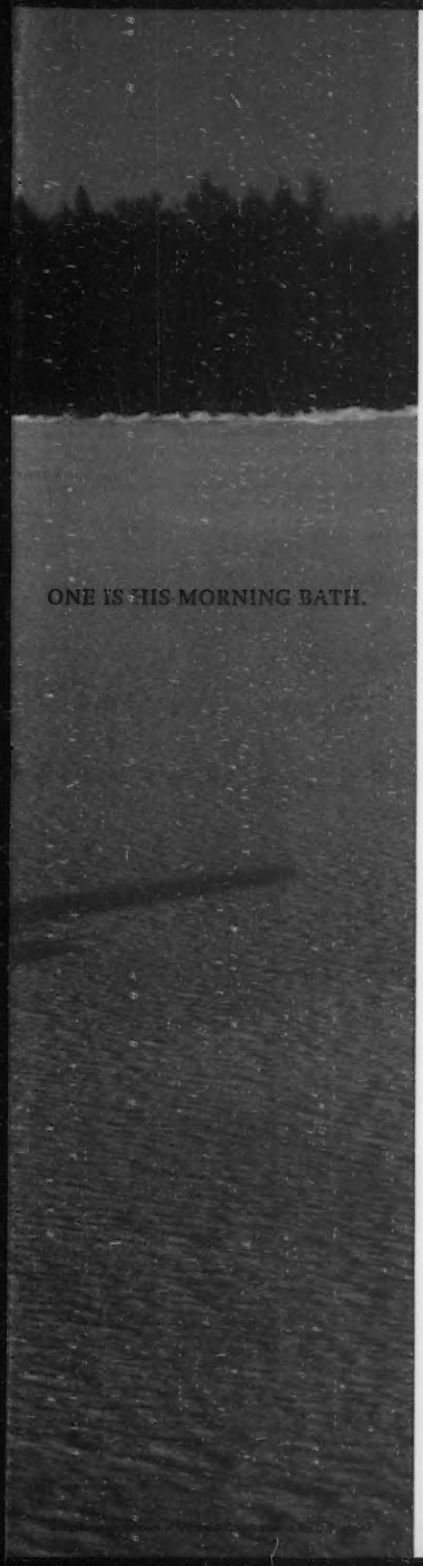

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21. Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr./PC Mgr., Tech. Planning, Administrative Services
23. Dir./Mgr. Sys. Development, System Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Management
60. Sys. Integrators/VARs/Consulting Management

CORPORATE MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President, Asst. Vice President
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
51. Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
80. Information Centers/Libraries, Educators, Journalists, Students
90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply.)

Operating Systems
(a) Solaris (e) Mac OS
(b) NetWare (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTStep

App. Development Products ❒ Yes ❒ No
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90. Computer/Peripheral Dealer/Dist./Retailer
95. Other_____ (Please Specify)

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3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply.)

Operating Systems
(a) Solaris (e) Mac OS
(b) NetWare (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTStep

App. Development Products ❒ Yes ❒ No
Networking Products ❒ Yes ❒ No
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REINVENTING *the* SUPPLYCHAIN

CONTINUED FROM PAGE 101

CW: You write that "the best demand-chain players (the ones who serve the consumer best) will use capability rather than size and position to gain a competitive edge." What role does IT play in that quest?

BLACKWELL: There is a function of IT in understanding the mind of the consumer, and that is transforming data into information — and ultimately transforming information into knowledge and strategy.

If you go back to the early days of IT, they were primarily keeping records of what happened in the past. But that's no longer enough. Today, it is imperative to use that data to build models of the future about how consumers are going to respond.

It's no longer just keeping track of what's going on in buying patterns, it's building models — statistic or otherwise — to forecast what the consumers will do in the future.

That seems to be one of the major directions: the shift from information that tells us what has happened to the creating of information that will tell us what will happen.

That's essential in building demand chains, and that requires people within the firm who understand the big picture that separates data from information and builds knowledge.

Some of the greatest entrepreneurial opportunities have been for people who discovered within their own firm how to convert data into knowledge, then create new start-ups or new services selling that same ability to many firms. That is the entrepreneurial dream, from Silicon Valley to Silicon Glen in Scotland.

CW: You mention several demand-chain leaders, such as Wal-Mart Stores, Inc., Nike, Inc. and Cardinal Health, Inc. What are those companies doing from a technical perspective that their competitors aren't?

BLACKWELL: The simple thing they are doing is adding more terabytes. Wal-Mart has 27T bytes of data [on customers and products] now, and rumors are that that may be expanded.

But that's the easiest thing they do. What they really do is understand how to use all those terabytes. They get the big picture. Some of the people who handle data are like dogs watching TV. Have you ever noticed them? They just don't get it. It's not data that we want, it's knowledge — but knowledge only comes from understanding the uses of knowledge.

The greatest leaders of business can conceptualize the problems they're trying to solve. Too many people just go through life doing what they are supposed to be doing. But the visionary leaders understand where this is all going and why they're doing the demand chain rather than just what they've always done.

That's what makes [CEO Robert D.] Walter at Cardinal Health and Sam Walton different from other people. They are able to conceptualize rather than just do. Most businesses are run by people who have tunnel data and tunnel vision. They accumulate data to tell them what has happened. The great leaders are those who understand what's at the end of the tunnel.

CW: How can companies and IT leaders take the standard data that's being used and turn it into a big vision? What's the secret?

BLACKWELL: The secret, and that's the essence of the book, is focusing on the consumer market and the problems that need to be solved. It's the difference between consumption analysis, which studies the way people use products, and buyer behavior, which studies what they do in stores.

If you understand the problems people have, then you can come up with new solutions. And this is how the Kinkos of the world function. They don't focus on copying machines and paper. They help people produce documents, and that's a difference in perspective. Focusing on the technology will perhaps make good IT people who are excellent at handling data, but it doesn't make leaders, because technology only determines what we can do for society. It's society's values that determine what people will actually accept of technology.

The world is full of failures in technology, not because they didn't solve problems well, but rather because they didn't solve problems that people cared about. Most new products don't fail because they won't function properly; they fail because they don't do anything that people feel strongly enough about to change their old behavior. I have encountered great IT people, and sometimes they were far less competent in a technical way than people who were handling the data on a day-to-day basis. But they understood the big picture. And that, of course, is one of the things I hope the book does.

CW: Are a lot of these leaders using cutting-edge technologies, or are they just working smarter with what they have?

BLACKWELL: They are working smarter. And in most cases, working bigger — 27T bytes at Wal-Mart!

Most of the leaders have been highly receptive to technology from the beginning. Cardinal Health has been able to use IT to manage the very complicated problem of many items in the pharmaceutical industry. Pharmaceutical industries have to be carefully controlled. So firms like Cardinal Health have been in the vanguard of using computerized control of those products. It doesn't necessarily mean they've pioneered applications, but they have certainly been on the forefront of development and increased efficiency from the very beginning.

CW: What about using technology to figure out the consumer's mind?

BLACKWELL: Using databases is one of the ways to find the consumer. One of the hottest topics today is data mining and data warehousing. [In the book,] we give the example of Victoria's Secret, which is very good at using data warehousing.

But not all companies use technology. I'm always impressed by those who are good at using data warehouse techniques to really get objective large-scale data. But every once in a while, I'm impressed by people who are simply good, old-fashioned intuitive listeners.

IT allows us to do on a much larger scale what good business leaders have always been able to do on an intuitive basis: listen to the consumer. That's a lot easier to do when talking to a few consumers on a local basis than when talking to millions in geographically diverse areas. The latter situation demands the best in IT in order to allow executives to make good strategic decisions.

CW: What role do you see the Internet playing in the ability of demand-chain leaders to stay in touch with consumers?

BLACKWELL: The Internet will provide instant feedback of consumers' reaction to all things. One example of that is Amazon.com's use of reviews by readers.

The biggest [Internet] application may not be consumers. I happen to think the Internet is more commercially viable for business-to-business marketing than it is for business-to-consumer marketing at this point. A firm can, on either the Internet or intranet, get instantaneous feedback to products. We have to develop the capability of handling that data and transforming it into knowledge.

There is a huge market for IT people who are able to convert all the data floating around on the Internet into knowledge. □

Weston is Computerworld's *staff writer covering client/server software and Unix applications. His Internet address is randy_weston@cw.com.*

From Mind to Market: Reinventing the Retail Supply Chain, *by Roger D. Blackwell,* HarperCollins Publishers, New York, 251 pages, $25 (hardcover) ISBN 0-88730-833-3.

COMPUTERWORLD

For an audio interview with Roger Blackwell, visit our Web site: *www.computerworld.com*

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IT Careers

project management TOP GUNS

RICCARDO STAMPATORI

By Kathleen Melymuka

They are the "Top Guns" of IS. In a field known for supersonic speed, they push the envelope. They are the best of the best — project managers whose skills are legendary, whose projects have become models.

Top Guns exhibit extraordinary energy levels, phenomenal political skills and an absolute obsession with results, says David Frame, director of the International Center for Project Management Excellence at George Washington University. "It's like they're putting notches on their gun belts," he says.

True enough, says Sherry Higgins, a Top Gun at Lucent Technologies, Inc. "I want to build sand castles and leave. I don't want to be there when it needs to be painted. I want to hand it over and go on to the next one."

Interestingly, though their legends loom large, Top Guns aren't known for job-jumping.

"They aren't independent entrepreneurs," Frame says. "They are organizational people."

The organization rewards them handsomely in salary and, perhaps more important, psychic bonuses: increasingly challenging assignments that let them consistently prove their mettle. One characteristic they all exhibit is a love of the work.

"Projects that succeed are just about the most satisfying work experience you can have," says Steve McMenamin, a veteran Top Gun at Southern California Edison Co. "It's as much fun as you can have and still get paid for."

All Top Guns have skills, talent and a breadth of experience, but each has a unique style and characteristic approach that distinguishes his jobs like a trademark.

Equally personal are their career trajectories. Some want nothing more than to move on to ever-more-complex and challenging projects. Others use their skills in senior management positions. Still others have moved to the executive ranks only to be pressed back into temporary service when the feathers hit the fan blade. Following are the stories of a few of the best.

"Projects that succeed are just about the most satisfying work experience you can have. It's as much fun as you can have and still get paid for."

Steve McMenamin
Vice president of customer service
Southern California Edison Co.
Rosemead, Calif.
Years at company: 10
Years as a project manager: 10+

RECENT PROJECT

A huge new customer service system that was so successful, he was recruited to lead the organization for which it was built. "It was a case of justice," McMenamin says. "You built it; you figure out how to use it."

TRADEMARK: VISION

"I am lucky enough to be able to see a big field of play and keep a fairly large amount in my head and keep it fairly clearly sorted out. The necessary second part is I can convey that clarity to others.

"Typically, projects get in trouble where people are confused. Avoiding confusion requires seeing over the horizon, where you're trying to get, and conveying your clarity and confidence to others. The pace of a project is more than anything else a function of the confidence of people that there is a path and they're on it and it leads to a good place. It depends on how clear and how confident they are that somebody knows where they're going. You have to know it and convey it at the brain-stem level."

CAREER ADVICE

"One of the hardest things on a large project is really to figure out where the project is now. You can't trust anybody. Every time you ask a question, you have to ask a parallel question, which is, 'Why do I believe the answer I just got? Why do I think I know what I think I know?' It's amazing how what's going on gets filtered by people's desire to report good news."

"Executives are not looking for a good effort; they're looking for a quality product. They're not going to pat me on the back for a good try."

Gene Dressler
Program manager
GTE Telecommunications Services, Inc.
Tampa, Fla.
Years at company: 20
Years as a project manager: "I've had the project manager title for five years. Before that, I had the job but didn't have the title."

RECENT PROJECT

GTE's award-winning fraud-detection project was a classic "matrix" effort for which the team was composed of functional managers throughout the firm. Dressler's job was to "manage the white space" among the functional units. "This is art rather than science," says former supervisor and Information Systems Director Ron Caruana. "Gene knows how to deal with them and get information without being intrusive, and this is a critical element of his ability to succeed."

TRADEMARK: COMMUNICATION

"Something a project manager really controls is communications," Dressler says. "That's not just informing and relating status to different levels in the organization. It's a skill you have to hone. For example, if I give a very detailed status report, the general manager [of a functional group] will take himself to the lowest level and get himself involved. I have to keep him at arm's length.

"It takes a certain amount of good judgment. If I'm able to take care of things in the team domain, all I need to do is keep the boss informed at the milestone level. There's nothing to be gained by saying, 'Here's a problem we had, and here's how we solved it.' He may not be as happy with the solution as I was, and he may want to jump in, but it's history now."

CAREER ADVICE

"Stay out of the details. I've watched others get so far down in details, they've lost sight of what they're trying to do.

"Manage the risk. There always will be certain parts more susceptible to going wrong. Before we ever lay out a schedule, we look at four or five areas with high risk. We develop contingency plans and watch extra closely. Other project managers sometimes don't look until they're up against the wall."

"Project managers are responsible to set the tone for the project. It's very important for me that the project is fun in that it promotes creativity."

Sarah Gavit
Project manager
NASA's Jet Propulsion Laboratory
Pasadena, Calif.
Years at company: 6
Years as a project manager: 2

CURRENT PROJECT

Mars Microprobe Project, Deep Space II. The four-year project is designing and building two microprobe systems to be delivered to Mars in December 1999. The purpose is to site-validate key technology for future missions in which multiple landers or spacecraft will be delivered to a planet in a single mission.

TRADEMARK: TEAM BUILDING

"I have to encourage designers to take risks in areas where there's room for high potential payoff, and I don't punish them if they don't succeed," Gavit says. "I try to treat people well and reward them for exceptional work. It's also very important to encourage good personal relations among team members and promote team building.

"It's important to set a positive tone for the project, to make it a happy place to work. If people are happy, they're going to do incredible things. A good project manager really listens to his people and tries to create an environment where they're going to have fun doing the job. The more people enjoy coming to work every day, the more likely they are to communicate across the board. Fun really helps to break down barriers."

CAREER ADVICE

"Be honest. When problems happen, acknowledge them and try to head them off right from the start. Lay it on the table, jump on it immediately, and take it seriously immediately, because what seems like a small problem can fester and become big.

"Be very flexible. In this day where we're on these faster, better, cheaper programs, with very high turnaround and very high-risk technologies, you can come up with a great master plan, but things never go according to plan. You have to be flexible when changes come in to rapidly replan and not be discouraged by it."

"Establish personal accountability, consistency and trust. Don't put yourself too much in the center. That's destructive to team contribution."

Uwe Weissflog
Manager of strategic planning
Structural Dynamics Research Corp.
Milford, Ohio
Years at company: 4; 23 at previous company
Years as a project manager: 13

RECENT PROJECT

Halfway through a 12-month effort to integrate two complex business lines, the team was floundering, and the project looked doomed. Weissflog was recruited from strategic management to save it. "I had been pretty well-known in project management previously," he says. "Somebody looked up my resume and said, 'He can do this.' "

He did, bringing the project in within four days of the due date at a quality level above the standard.

TRADEMARK: STRUCTURE

"If we don't have something in front of our nose, we forget about it, so we snatched a conference room and declared it our home and used the room as a visual feedback mechanism. It looked like the NASA headquarters you see on TV. We displayed everything that was relevant."

The "contract," 35 main project tasks, was pinned to one wall. "This point sounds so simple, but by having this in front of us, we were forced to look at it. It created clarity. We knew what we had to do. It was so simple, but so effective. We could see very easily whether we were online or not.

"These things were all there to create structure, create the best possible environment where people could be at their best and be aligned in same direction and committed to what they wanted to do. It really sank into our brains. In the end, there was a collective understanding in the group."

CAREER ADVICE

"Always tell the truth. Create clarity about what is going on. Be clear about what you want to deliver. Then align the group into the direction you want to take that the deliverables suggest. Establish personal accountability, consistency and trust. Don't put yourself too much in the center as project manager. That's destructive to team contribution. Make sure you have the right skills in the group."

"The human relationship side of project management is the thing. You've got to love people, love the interrelationships with people."

Sherry Higgins
District manager for CIO project management
Lucent Technologies, Inc.
Hampton, Georgia (virtual office)
Years at company (Lucent/AT&T Corp.): 25
Years as project manager: 11

RECENT PROJECT

Higgins led the multicompany team that scheduled, planned and implemented telecommunications services for the 1996 Atlanta Olympics, including 37 sports venues, four athlete villages and 15 noncompetitive venues, such as broadcast and press centers. The project involved 15,000 telephones in all.

"The Olympics is different because there is a defined, definite end date that will not change," Higgins says. "No negotiation, no amount of political pull could move that date. I'd say, 'The torch will be lit on July 19 at 7:30. That's my story, and I'm sticking with it.' "

When the torch was lit, the phones were ready.

TRADEMARK: INTERPERSONAL SKILLS

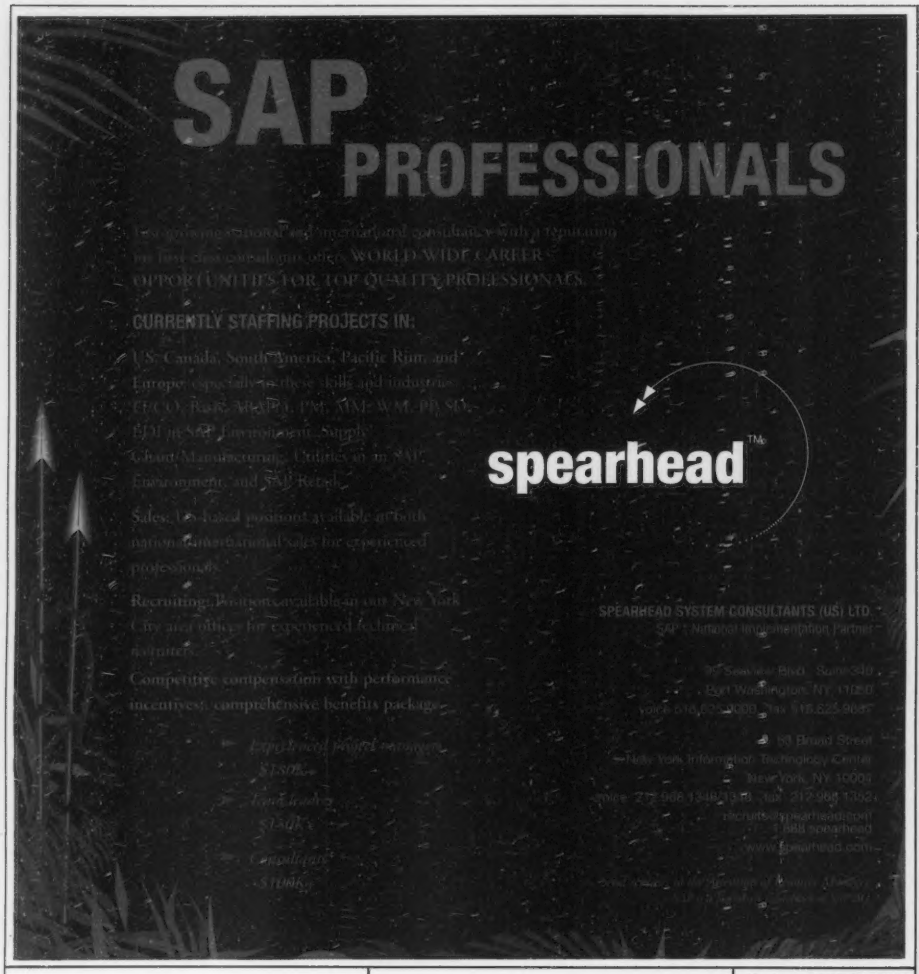
"A project manager is a certain personality type or has certain interpersonal skills. He can hold the whip but pat you on the back, too. The biggest thing to realize is you're working through that team. Everything gets done through the team. You've got to get people to do the things that need to be done and get them to want to do it."

The project was a jungle of political intrigue. "We had to keep in mind sponsors and the products they were going to donate. If AT&T was giving us phones, no one else could. We had to deal with little political things like that."

CAREER ADVICE

"Listen to the team, but lead the team. Set yourself up as the leader up front. Put yourself at the head of the table. Assume responsibility. Realize that you are totally accountable for success or failure. Once you do that, you'll do whatever you can to assure it is successful." □

Melymuka is a freelance writer in Duxbury, Mass.



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Northern New England

License plates in Maine read "Life as it should be" – that pretty much sums up life heah. And for IS pros, there are plenty of jobs, if you know where to look.

LANs *and* Lobsta

By Melanie Menagh

In some people's minds, northern New England — Maine, New Hampshire and Vermont — is quintessential America: small villages with picket fences, town greens with gazebos, and white church steeples enfolded by rolling hills.

That kind of life is still readily available in northern New England, but now you can have a fulfilling (and fairly lucrative) information systems career to go with it. You just have to know where and how to look.

Not surprisingly, the best jobs (and salaries) are found in areas closest to Boston. Southern New Hampshire and coastal Maine are experiencing minibooms in IS hiring. The farther north you go in both states, the more scarce, and less well-paying, jobs become. Vermont is a case unto itself. Its one major city, Burlington, has a variety of large and small firms. Elsewhere in the state, though, good IS jobs are few and far between.

Maine: Life Down East

"Lobsta" isn't the only thing that's red-hot Down East. In the southern corridor of Maine and running north up the coast (where everyone lives, anyway), IS professionals are in big demand. Bob Paquin, vice president of information services at L. L. Bean, Inc. in Freeport, is looking for project managers, database analysts, a webmaster and network and LAN people.

"As more companies were becoming agitated about the year 2000 [conversion problem], we saw availability of candidates dry up," Paquin says.

Some skills and job titles have become especially hard to come by in coastal Maine. "If you're looking for database skills, like Oracle or DB2, especially with someone with experience with more than one skill, people are scarce," Paquin says. "It may be six months before we can fill a position. For newer skills, like webmaster, we might take a chance and hire someone out of school who may not have experience but has pretty good training, because this universe is new to everybody."

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Abbie Brown, chief information officer at Unum Life Insurance Company of America in Portland, is looking for mainframe and client/server professionals. Skills most needed are Cobol, DB2, CICS and C++. Skill sets in demand are consistent with those in Boston, New York and Los Angeles, says Brown, who is also focusing on applicants' soft skills. "Are they motivated? Do they learn quickly? Can they work well with business partners? These things are critically important," she says.

New Hampshire: The Granite State

In southern New Hampshire, companies have more IS jobs than they can possibly fill.

"We're looking for Progress programmers and network analysts," says Christine Wolfe, manager of business and technical systems at FCI Framatone Connectors International in Manchester. "We can't get enough good people. There are a lot of contractors out there, and we're really looking for people who want to be staffers."

But with some programming jobs remaining vacant for as long as six months, Wolfe has had to use more contract help.

In the local market as a whole, Wolfe sees need for Unix-, Oracle-, Novell- and Microsoft-certified people. Hot industries are banking, manufacturing, insurance and health care.

Gibson "Mike" Kennedy, director of information resource management at Sanders, a unit of Lockheed Martin Corp. in Nashua, also is trolling for staff. "We're hiring a continuing rotation of people throughout the organization. It's a hot job market for IT people here," he says. Kennedy says the movement of other businesses into town has put upward pressure on salaries. He has openings across the board — entry level, telecommunications, networking and engineering support.

Sanders has been aggressive about retaining and attracting new blood, with good wages and an innovative nine-day, 80-hour schedule that gives all employees three days off every other weekend. Farther north (for example, above Concord), jobs and companies thin out.

Vermont: The Green Mountain State

"People have got to like Vermont. Coming here, you have to make a lifestyle choice as well as a career choice," says Mark Levesque, senior vice president of IS at National Life Insurance Co. in Montpelier. "We bring them up in June, and when January comes, they want to go back to Virginia."

There isn't a plethora of IS jobs in the state, especially at the entry level. "You have to come with a skill set that's in demand," says Tom Stanziola, manager of application systems and services at Central Vermont Public Service Corp. in Rutland. "No one's going to take you and teach you here."

There are exceptions. Manny Cacciola, microelectronics site IS manager at IBM in Burlington, says, "We go off to colleges to bring in new folks for vitality hiring." Once there, "We develop a skills-enhancement plan for each employee."

But IS can be a tough row to hoe in Vermont. "If you want a change, you can't just go across the street and find another job. It's a small state; there are jobs to be had, but we can't take in a million people," says William Montgomery, senior vice president of IS at Fletcher Allen Health Care and a staffer at the University of Vermont's College of Medicine. Even so, "We're having trouble finding staff, and people can easily find jobs if they have any kind of technical training at all," he said. □

Menagh is a freelance writer in Maple Corner, Vt.

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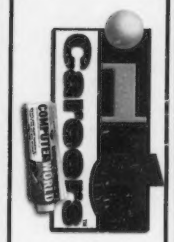

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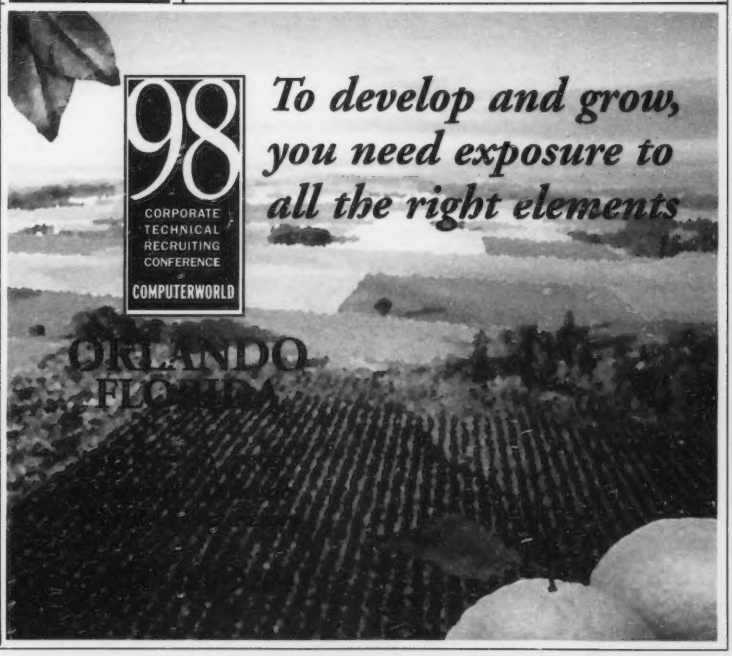

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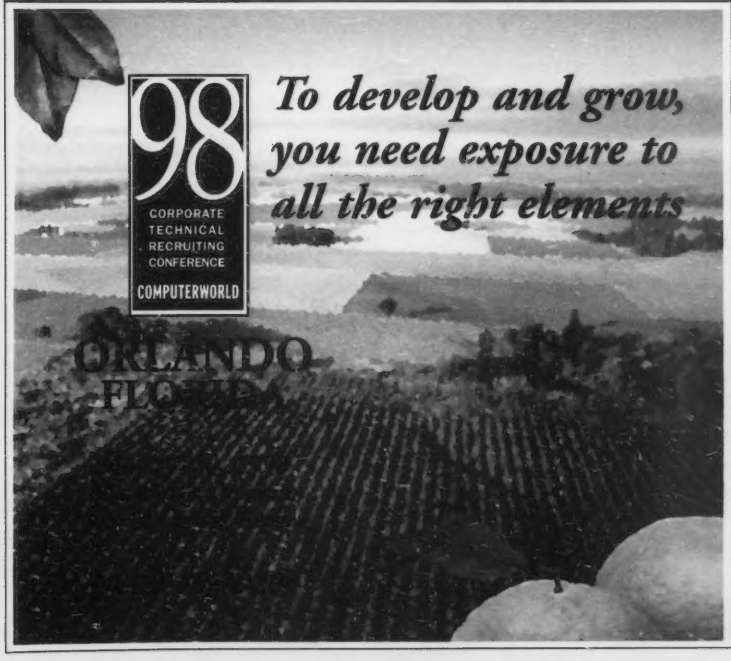

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4 Software Engineers sought to work on the requirements definition, analysis, functional specifications, design, implementation and maintenance of information management systems, including new developments and modifications, in a client-server computing environment. Manage projects and provide estimates for development time and parameters of modifications to determine cost justifications. Write test plans for software developed. Provide support for implemented software to the end users. Requirements: M.S. in Engineering (any discipline with strong course background in CS/CE/EE/Math) plus 1 yr. experience in Job Offered or related occupation (System/Analyst, Prog/Analyst, software development, research, R&D or related) or B.S. plus 5 yrs. progressive experience. Education or experience must include the special requirements: information system technology; RDBMS (such as Oracle, Informix, Sybase); object oriented concepts and methodology; SQL, Unix, Windows. Hours. M-F, 8 am-5 pm; 40 hrs/wk. Salary $59,450/yr. Must be willing to travel to various client sites throughout the U.S. Send resume in duplicate to: Case #71045, P.O. Box 8968, Boston, MA 02114.

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Software engineer with 5 years of experience as a s/w engineer or computer professional, with experience as a supervisor or manager, who will develop s/w systems, applying computer science, engineering, and mathematical analysis, with 5 years of experience using ORACLE RDBMS, UNIX, C, Novell and PL/SQL. Analyzes s/w reqs. and performs testing and user training after development. Extensive travel and frequent relocation. Bachelor's degree in one of several limited fields: engineering, mathematics, computer science or physics. $60,000/yr. 40 hours/wk., 9:00 am - 5:00 pm. Send resumes, listing job order number 5014401, to: Mr. James McCoy, Manager, Office of Employment Security, 6206 Broad Street, Pittsburgh, PA 15206.

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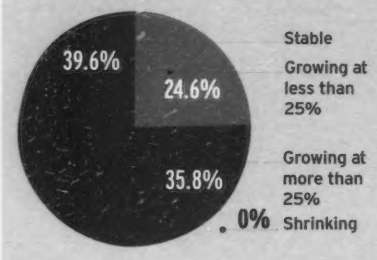

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Survey Base: 187 Technology Firms involved in Software related Services
Survey conducted between July '97 and September '97;

CorpTech, a directory publisher in Woburn, Mass., tracks the U.S. 45,000 technology manufacturers. This survey relates to the 31,693 tracked firms with fewer than 1,000 employees.

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NEW & NOTABLE

Champion's Stellar² takes the industry by storm

Since May 19, when Champion Duplicators released their unattended CD duplicator, the Stellar² has exceeded all expectations and become the dominant product in the media duplication market.

The demand for CD duplication is increasing as many users of floppy diskettes are now switching to writable CD-Rs. One CD-R can hold the information equivalent to that of nearly 500 floppy diskettes! This makes DC-Rs a vaiable option for those who copy sets of two or more diskettes.

"When we created this product, we hoped for it to be a great success," says David Wolfer, President and CEO. "But the amount of its success thus far has astounded us."

The Stellar² has revolutionized this market because it is everything end-users want. It is a tray based system holding 150 discs in its hoppers – three times the normal capacity of unattended systems. The Stellar² houses two full speed, simultaneous writers as opposed to one writer. The loading mechanism, utilizing a turntable concept, quickly and accurately singulates discs without causing noise or vibration to the writers.

In all, the Stellar² is a simple to use, intuitive, reliable, affordable and continuous duty machine.

"The CD-R market, in general, is exceeding original forecasts," says Dale Brown, VP Sales and Marketing. "But, we have experienced record sales far above what we thought achievable for this product in a new field of unattended CD duplicators."

The Stellar² is available in standalone or PC hosted systems and is priced at approximately $8,000 for a two channel system complete with writers.

Contact Champion's Sales Department at (510) 373-6060, Fax (510) 373-8160, e-mail: customercare@www.championsms.com or http://www.championsms.com

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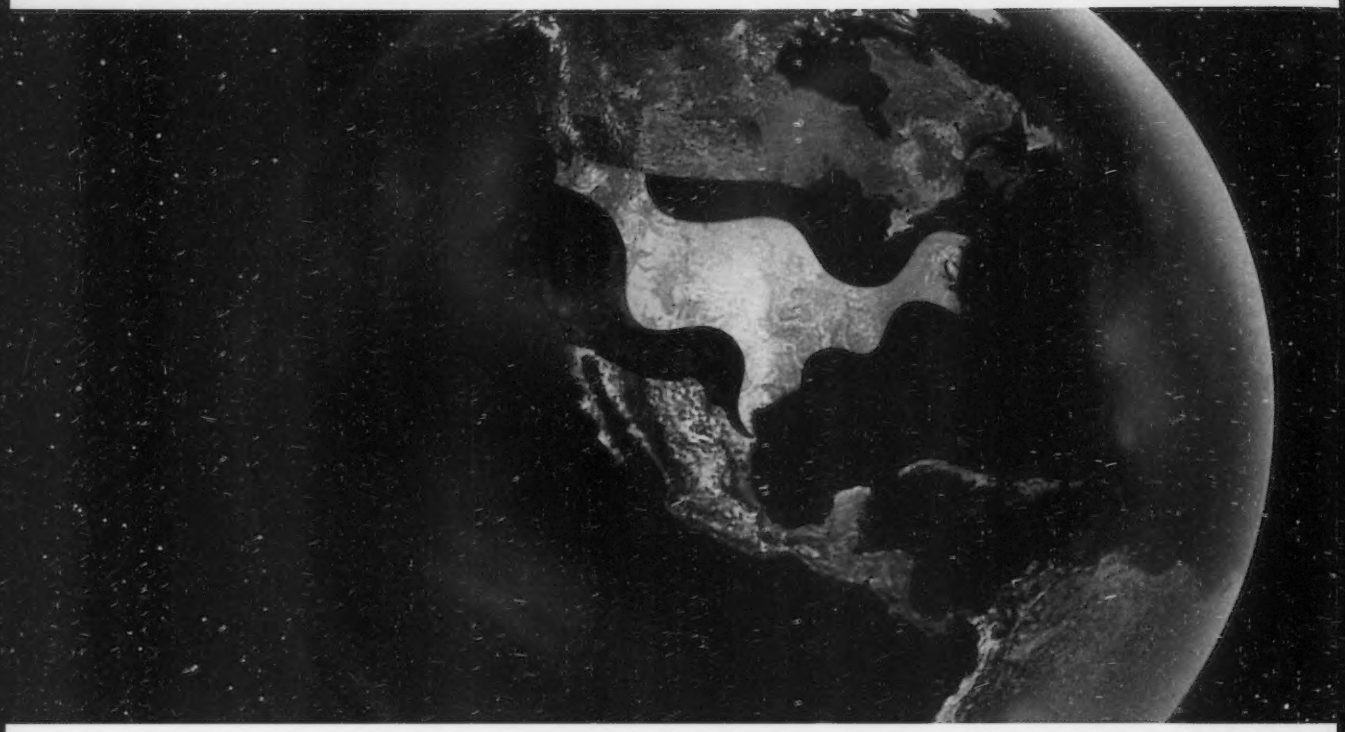
No purchase necessary. All entries must be received no later than 11:59 am (EST) Mon., Oct. 27, 1997. Winner will be determined in a random drawing on or about 5:00 pm (EST) Mon., Oct. 27. See official rules within the Marketplace section.



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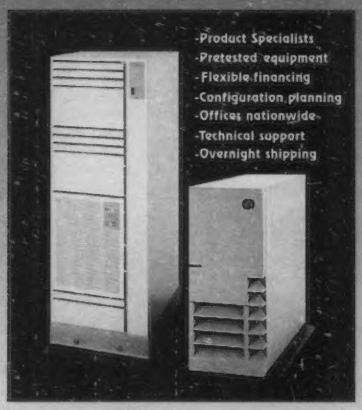

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Super Prize Sweepstakes - Winners will be selected in random drawings from all eligible entries received. Early Bird winner will be selected in a separate drawing from among all eligible entries. Sweepstakes begins 9/3/96. Drawings will be conducted on or about 4/30/98 by Ventura Associates, Inc., an independent judging organization whose decisions are final. Drawing will be held at 1040 Avenue of the Americas, New York, NY 10018. You need not be present to win.

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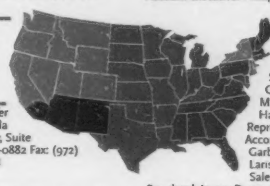

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STOCK TICKER

The Week in Stocks

Gainers

PERCENT

Netcom On-Line(H)	36.7
Proteon Inc.	21.2
Intergraph Corp.(H)	18.2
Learning Co. (The)	17.6
Red Brick Systems Inc.	17.4
Checkpoint Software Technologies,	17.0
Comshare Inc.(L)	14.7
Business Objects	11.0

DOLLAR

Checkpoint Software Technologies,	5.81
Netcom On-Line(H)	5.25
Sprint Corp.(H)	3.31
Ceridian Corp.	2.50
Learning Co. (The)	2.44
MCI Commmunications Corp.	2.38
Intergraph Corp.(H)	2.00
ViewLogic Systems(H)	1.50

Losers

PERCENT

MTI Technology Corp.(H)	-26.9
Racotek Inc.	-25.8
Microage Inc.	-23.1
Cypress Semiconductor Corp.	-20.7
Sun Microsystems Inc.	-20.1
LSI Logic Corp.	-19.8
Seagate Technology	-19.6
Network Computing Devices	-19.4

DOLLAR

Texas Instruments(H)	-12.25
Intel Corp.	-11.50
McAfee Associates	-11.25
IBM	-9.88
Lattice Semiconductor	-9.44
Sun Microsystems Inc.	-9.13
Seagate Technology	-7.81
Yahoo! Inc.	-7.38

INDUSTRY ALMANAC

Growth slows at Intel

Has Intel Corp.'s semiconductor market domination begun to show the tiniest hint of a crack or is the industry giant merely toying with its competition?

Intel officials last week said the company's gross profit margins have dropped and warned that next quarter's sales could be flat. Investors reacted by dropping the stock more than five points to 86-1/2.

Following this news, competitor Advanced Micro Devices, Inc. (NYSE:AMD) said it will unveil multimedia chips that are faster and cheaper than Intel's. Several analysts say Intel also will start to feel competition from Cyrix Corp. (Nasdaq:CYRX) and integrated Device Technology, Inc. (IDT) (Nasdaq:IDTI) in the chip market for sub-$1,000 PCs. Historically, Intel hasn't paid much attention to the low-margin market. But with sales of the low-priced machines growing, Intel said last week it will consider bringing out a low-priced chip set.

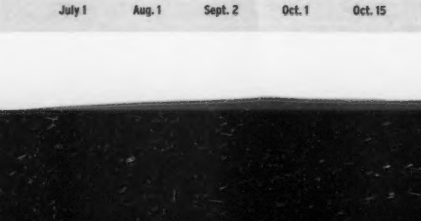
Another view of the situation is that Intel may actually welcome the competition in the face of the Federal Trade Commission's investigation for market monopoly and anticompetitive practices. Michael Murphy, a market analyst in Half Moon Bay, Calif., and editor of "The California Technology Stock Letter," said Cyrix's pending merger with National Semiconductor Corp. will give Cyrix a boost, especially in low-end machines.

Mona Eraiba, an analyst at Grunthal & Co. in New York, says the market may have room for competition because "nobody has paid much attention to the low-end market. Someone like IDT could really carve out a little place for themselves."

Mike Geran, an analyst at the Pershing division of Donaldson, Lufkin & Jenrette Securities Corp. in Jersey City, N.J., says IDT's sales volume is too small right now to bother Intel, but he said Cyrix and AMD will be interesting to watch. But, he said, "neither Cyrix nor AMD have started to ship any particularly high volumes yet either." — Stewart Deck

LOW-END PUSH

Intel may feel heat from its competitors for sub-$1,000 PC chip sets. That is reflected in rivals' stock prices.



Exch	52-Week			Oct. 17 2 PM	Wk Net Change	Wk Pct Change
Communications and Network Services						**OFF 5.32%**
COMS	81.38	24.00	3 COM Corp.	48.88	-7.00	-12.5
AIT	71.75	54.00	AMERITECH Corp.	65.50	-1.44	-2.1
ASND	80.25	30.00	Ascend Communications	35.00	1.31	3.9
T	47.44	30.75	AT & T	44.50	-0.81	-1.8
BNYN	6.50	1.19	Banyan Systems Inc.	3.31	-0.50	-13.1
BAY	41.88	15.38	Bay Networks Inc. (H)	34.25	-6.56	-16.1
BEL	84.88	56.75	Bell Atlantic Corp.	79.69	-0.75	-0.9
BLS	49.44	36.25	Bellsouth Corp.	46.63	-0.56	-1.2
BRKT	42.25	9.25	Brooktrout Technology	13.50	-2.25	-14.3
CS	46.50	27.50	Cabletron Systems	30.56	-2.75	-8.3
CGRM	21.88	8.63	Centigram Communications (H)	17.63	-2.88	-14.0
CSCO	83.50	45.25	Cisco Systems Inc. (H)	79.50	-2.00	-2.5
CMNT	7.00	3.31	Computer Network Tech.	5.00	-0.19	-3.6
DIGI	32.75	12.63	DSC Communications	29.94	-0.69	-2.2
FORE	43.50	10.00	FORE Systems Inc.	17.94	-2.94	-14.1
GDC	12.38	5.38	General Datacomm Inds.	6.38	-0.63	-8.9
GSX	53.00	36.13	General Signal Networks	40.69	-1.63	-3.8
GTE	52.25	38.50	GTE Corp.	45.44	-5.25	-10.4
LU	90.75	44.75	Lucent Tech.	84.25	-3.94	-4.5
MADGF	16.13	4.50	Madge Networks NV	7.38	-0.75	-9.2
MCIC	43.38	23.88	MCI Communications Corp.	37.69	2.38	6.7
NETM	8.50	2.50	NetManage Inc.	4.44	0.44	10.9
NTRX	8.00	1.44	Netrix Corp.	2.19	0.06	2.9
NCDI	16.25	6.00	Network Computing Devices	8.56	-2.06	-19.4
NWK	22.38	11.25	Network Equipment Tech.	18.81	-1.31	-6.5
NETG	30.25	11.13	Network General	21.94	0.25	1.2
NN	69.38	26.50	Newbridge Networks Corp.	60.00	-4.25	-6.6
NT	113.88	57.75	Northern Telecom Ltd.	105.63	-2.06	-1.9
NOVL	13.00	6.28	Novell Inc.	8.88	-0.78	-8.1
ODSI	19.25	9.75	Optical Data Systems Inc.	11.00	0.00	0.0
PCTL	37.88	8.25	Picturetel Corp.	10.06	-0.69	-6.4
PTON	4.25	1.31	Proteon Inc.	2.50	0.44	21.2
RACO	6.00	1.44	Racotek Inc.	1.44	-0.50	-25.8
RETX	9.25	3.38	Retix	6.38	-0.69	-9.7
SBC	65.88	47.00	SBC Communications (H)	63.44	-0.44	-0.7
SFA	24.94	13.25	Scientific-Atlanta Inc.	21.50	-0.63	-2.8
SHVA	56.13	8.25	Shiva Corp.	11.63	-2.56	-18.1
FON	56.38	37.50	Sprint Corp. (H)	54.06	3.31	6.5
SMSC	18.13	8.25	Standard Microsystems Corp.	14.25	-1.25	-8.1
USW	41.00	29.25	U S West Inc.	37.75	-0.88	-2.3
XIRC	31.13	7.50	Xircom	11.03	-0.84	-7.1
XYLN	52.00	12.38	Xylan Corp.	20.63	-2.19	-9.6
PCs and Workstations						**OFF 8.27%**
AAPL	29.56	12.75	Apple Computer Inc.	20.00	-2.25	-10.1
CPQ	79.56	20.50	Compaq Computer Corp.	69.94	-6.69	-8.7
DELL	103.25	19.00	Dell Computer Corp. (H)	93.75	-6.06	-6.1
GTW	46.25	19.38	Gateway 2000 Inc.	33.75	-2.56	-7.1
HWP	72.94	42.75	Hewlett Packard Co.	63.69	-4.75	-6.9
MUEI	25.38	12.63	Micron International Inc.	15.50	-1.31	-7.8
NIPNY	74.00	53.50	NEC America	63.00	1.38	2.2
SGI	30.31	12.63	Silicon Graphics	15.50	-1.69	-9.8
SUNW	53.31	25.50	Sun Microsystems Inc.	36.31	-9.13	-20.1
Large Systems						**OFF 5.12%**
DGN	37.94	13.63	Data General Corp.	24.94	-0.44	-1.7
DEC	50.94	25.00	Digital Equipment Corp. (H)	47.31	-2.69	-5.4
IBM	109.44	62.00	IBM	95.25	-9.88	-9.4
MDCD	8.75	2.88	Meridian Data Inc.	4.94	-0.31	-6.0
PRCM	20.13	9.00	PeroCom Technology, Inc.	16.25	-1.88	-10.3
SQNT	31.25	12.88	Sequent Computer Sys.	25.75	-0.81	-3.1
TEXM	3.88	2.06	Sequoia Systems Inc.	3.25	-0.06	-1.9
SRA	60.75	21.25	Stratus Computer Inc.	46.38	-2.25	-4.6
UIS	16.50	5.75	Unisys Corp. (H)	14.56	-0.56	-3.7
Software						**OFF 3.29%**
ADBE	53.13	32.50	Adobe Systems Inc.	47.00	-3.88	-7.6
AMSWA	15.63	4.63	American Software Inc.	11.50	-1.69	-12.8
APLX	40.00	3.13	Applix Inc.	8.25	-1.56	-15.9
ARSW	53.25	17.00	Arbor Software (H)	46.25	-4.00	-8.0
ADSK	51.13	21.00	Autodesk Inc.	45.25	-4.38	-8.8
BGSS	38.00	21.00	BGS Systems Inc.	31.94	0.44	1.4
BMCS	69.50	39.63	BMC Software Inc.	61.50	-5.00	-7.5
BOOL	35.25	16.75	Boole and Babbage	30.50	-0.25	-0.8
BORL	10.75	4.75	Borland Int'l. Inc. (H)	9.75	-0.13	-1.3
BOBJY	18.75	6.63	Business Objects	12.63	1.25	11.0
CAYN	6.25	2.00	Cayenne Software Inc.	3.00	-0.03	-1.0
CNTR	5.88	1.13	Centura Software	2.31	-0.13	-5.1
CHKPF	39.94	15.63	Checkpoint Software Technologies	33.94	5.81	17.0
COGNF	39.50	21.50	Cognos Inc.	23.25	-1.19	-4.9
CA	78.19	37.25	Computer Associates	73.31	-3.44	-4.5
CVN	10.38	1.94	Computervision Corp.	2.88	-0.44	-13.2
CPWR	69.25	22.50	Compuware Corp.	66.38	-1.88	-2.7
CSRE	18.88	6.63	Comshare Inc. (L)	7.81	-1.00	14.7
COSFF	9.69	3.75	Corel Corp	4.00	-0.13	-3.0
DWTI	6.63	2.25	Dataware Technologies Inc.	4.25	0.06	1.5
FILE	36.50	9.50	Filenet Corp.	22.50	-2.38	-9.5
FRTE	47.00	7.25	Forte Software	14.00	-0.38	-2.6
FTPS	8.63	3.50	FTP Software Inc.	3.59	-0.13	-3.4
HUMCF	54.25	22.00	Hummingbird Comm. Ltd. (H)	40.38	-0.38	-0.9
HYSW	33.38	13.00	Hyperion Software Corp. (H)	32.69	1.44	4.6
IRIC	19.75	11.13	Information Resources (H)	17.81	-0.94	-5.0
IFMXE	29.50	5.88	Informix Corp.	6.63	-0.63	-8.6
INGR	14.19	6.25	Intergraph Corp. (H)	13.00	2.00	18.2
LEAF	3.69	0.81	Interleaf Inc.	2.63	-0.06	-2.3
ISLI	18.50	6.25	Intersoly Inc.	15.00	-0.63	-4.0
INTU	40.25	20.88	Intuit Inc.	29.88	-3.25	-9.8
TLC	25.75	5.50	Learning Co. (The)	16.31	2.44	17.6
LGWX	12.13	4.13	Logic Works	11.38	-0.25	-2.2
MAPS	12.75	7.88	MapInfo Corp.	9.00	-0.50	-5.3
MATH	5.25	2.19	MathSoft	3.63	-0.31	-7.9
MCAF	78.50	36.50	McAfee Associates	53.75	-11.25	-17.3
MENT	13.13	6.50	Mentor Graphics	11.25	0.19	1.7
MIFGY	39.13	12.75	Micro Focus	37.25	-0.75	-2.0
MGXI	9.00	4.00	Micrografx Inc.	7.75	-0.31	-3.9
MSFT	150.75	65.63	Microsoft Corp.	132.13	-5.25	-3.8
OBJS	3.13	0.88	ObjectShare, Inc. (H)	1.16	0.03	2.8
ORCL	42.13	22.50	Oracle Corp.	33.44	-2.81	-7.8
PMTC	64.25	37.50	Parametric Technology	46.06	-2.44	-5.0
PSFT	66.38	30.63	Peoplesoft	60.63	-2.63	-4.2
PTEC	19.75	11.00	Phoenix Technologies	16.75	-0.38	-2.2
PSQL	13.75	6.50	Platinum Software	10.00	-1.38	-12.1
PLAT	26.75	10.25	Platinum Technology (H)	25.44	1.13	4.6
PRGS	25.25	12.63	Progress Software Corp. (H)	23.75	0.38	1.6
RNBO	28.00	13.75	Rainbow Technologies Inc. (H)	26.75	0.25	0.9
REDB	28.00	5.00	Red Brick Systems Inc.	8.88	1.31	17.4
ROSS	9.75	1.75	Ross Systems, Inc.	3.94	-0.31	-7.4
SAPE	61.00	30.00	Sapient Corp.	52.63	-3.38	-6.0
SCOC	8.63	3.13	SCO Inc.	5.19	-0.31	-5.7
SDTI	44.38	21.00	Security Dynamics Tech.	39.63	-0.38	-0.9
SOTA	17.63	8.88	State of the Art (H)	15.63	0.13	0.8
SSW	36.75	27.25	Sterling Software Inc.	35.56	-0.25	-0.7
SDRC	30.00	17.13	Struct. Dynamics Research	22.38	0.31	1.4
SYBS	23.63	12.13	Sybase Inc. (H)	18.56	-4.44	-19.3
SYMC	25.75	9.88	Symantec Corp.	20.38	-1.88	-8.4
SNPS	48.75	21.75	SynOpsys	38.75	-5.25	-11.9
SSAX	17.63	3.88	System Software Assoc.	11.50	-2.38	-17.1
SYSF	30.75	7.38	Systemsoft Corp.	8.63	-1.06	-11.0
TRUV	4.63	1.50	Truevision Corp.	3.38	-0.38	-10.0
VIEW	25.50	8.38	ViewLogic Systems (H)	24.50	1.50	6.5
VMRK	11.75	5.75	VMark Software Inc.	8.00	-1.50	-15.8
WALK	18.25	10.50	Walker Interactive Systems	14.88	-1.44	-8.8
WALL	29.13	12.75	Wall Data Inc.	16.88	-1.25	-6.9
WANG	25.00	16.00	Wang Laboratories Inc. (H)	23.50	-0.19	-0.8
Internet						**OFF 3.88%**
AMZN	57.75	15.75	Amazon.com	42.75	-5.00	-10.5
AOL	87.44	22.38	America On-Line (H)	83.88	-0.31	-0.4
ATHM	33.63	16.63	At Home Corp.	24.25	-4.50	-15.7
CSRV	14.56	8.63	Compuserve Corp.	12.88	-0.56	-4.2
EDFY	21.75	8.88	Edify Corp.	18.00	-1.88	-9.4
XCIT	35.00	5.50	Excite, Inc.	32.44	-1.00	-3.0
SEEK	14.50	4.38	Infoseek Corp. (H)	11.88	-0.13	-1.0
LCOS	42.00	9.50	Lycos Inc.	32.88	-0.63	-1.9
NETC	21.88	7.88	Netcom On-Line (H)	19.56	5.25	36.7
NSCP	65.00	23.50	Netscape Comm. Corp.	34.00	-6.00	-15.0
OMKT	25.06	6.50	Open Market Inc.	14.50	-1.00	-6.5
PSIX	14.50	5.50	PSINet	8.13	-0.63	-7.1
QDEK	7.13	2.00	Quarterdeck Corp.	2.63	-0.06	-2.3
RAPT	25.75	8.88	Raptor Systems	16.13	-0.25	-1.5
SCUR	13.50	4.75	Secure Computing Corp.	10.75	-1.25	-10.4
SPYC	19.50	6.00	Spyglass Inc.	9.63	0.00	0.0
YHOO	58.63	11.25	Yahoo! Inc.	46.50	-7.38	-13.7
Semiconductors						**OFF 10.26%**
AMD	48.50	17.00	Advanced Micro Devices	27.69	-3.69	-11.8
ADI	36.69	18.75	Analog Devices Inc. (H)	33.69	-1.75	-4.9
CHPS	26.50	7.88	Chips and Technologies	15.56	0.38	2.5
CRUS	24.25	8.00	Cirrus Logic	16.69	-0.63	-3.6
CY	18.94	10.50	Cypress Semiconductor Corp.	12.00	-3.13	-20.7
CYRX	35.00	16.75	Cyrix (H)	29.00	-5.56	-16.1
INTC	102.00	51.88	Intel Corp	82.13	-11.50	-12.3
LSCC	74.50	33.38	Lattice Semiconductor	56.81	-9.44	-14.2
LSI	46.88	24.25	LSI Logic Corp.	24.25	-6.00	-19.8
MCRL	46.88	9.13	Micrel Semiconductor Inc. (H)	38.00	0.38	1.0
MU	60.06	24.88	Micron Technology	33.00	-5.00	-13.2
MOT	90.50	44.13	Motorola Inc.	67.81	-6.63	-8.9
NSM	42.88	17.63	National Semiconductor (H)	35.63	-6.88	-16.2
TXN	142.50	47.50	Texas Instruments (H)	125.13	-12.25	-8.9
VLSI	38.69	14.88	VLSI Technology	33.94	-2.06	-5.7
XLNX	58.50	31.88	Xilinx	37.31	-7.31	-16.4
ZLG	29.50	17.00	Zilog Inc.	20.38	-1.13	-5.2
Peripherals and Subsystems						**OFF 6.14%**
ADPT	54.25	28.63	Adaptec Inc.	47.38	-5.63	-10.6
APCC	31.50	15.25	American Power Conversion	24.88	-4.44	-15.1
CREAF	28.00	5.38	Creative Technology Ltd.	23.25	-1.63	-6.5
RACE	24.50	6.50	Data Race Inc.	7.50	-1.38	-15.5
DTM	12.50	6.75	Dataram Corp.	8.56	-0.44	-4.9
EMC	65.13	23.75	EMC Corp. (H)	56.75	-6.19	-9.8
EMLX	21.25	14.13	Emulex Corp.	18.63	-0.50	-2.6
ESCC	35.88	20.00	Evans and Sutherland (H)	32.75	-0.13	-0.4
EXBT	17.50	9.50	Exabyte	10.88	-0.19	-1.7
IISLF	2.63	1.06	Intelligent Info. Systems	1.22	0.06	5.4
IOM	29.13	14.13	Iomega Corp.	26.13	1.50	6.1
IPLS	2.81	0.94	IPL Systems Inc.	1.94	0.19	10.7
KMAG	36.75	15.31	Komag Inc.	18.88	-2.19	-10.4
MTSI	34.88	16.63	Micro Touch Systems Inc.	28.25	-2.25	-7.4
MTIC	17.88	2.06	MTI Technology Corp. (H)	12.56	-4.63	-26.9
PNCL	8.63	0.59	Pinnacle Micro Inc.	0.81	-0.03	-3.7
AQM	6.00	2.38	QMS Inc.	2.94	0.00	0.0
QNTM	43.25	9.25	Quantum Corp.	38.00	-1.94	-4.9
RDUS	1.88	0.19	Radius Inc.	0.56	-0.03	-5.3
SEG	56.25	31.00	Seagate Technology	32.06	-7.81	-19.6
SOS	19.63	9.75	Storage Computer Corp.	10.63	-0.38	-3.4
STK	57.25	33.25	Storage Technology (H)	50.94	-4.69	-8.4
TEK	69.63	38.75	Tektronix Inc.	63.38	-3.31	-5.0
WDC	54.75	21.88	Western Digital Corp.	36.19	-5.44	-13.1
XRX	86.13	44.63	Xerox Corp.	84.31	-0.56	-0.7
Services						**OFF 4.49%**
AMSY	37.13	15.75	American Mgmt. Systems	19.13	0.63	3.4
ANLY	46.50	21.25	Analysts Int'l. (H)	42.25	-2.75	-6.1
AUD	52.00	26.56	Auto Data Processing (H)	50.75	0.69	1.4
BDMI	28.63	19.75	BDM International Inc.	24.50	0.94	4.0
CATP	38.94	21.25	Cambridge Tech. Partners	36.25	-0.19	-0.5
CEN	52.75	29.50	Ceridian Corp.	40.25	2.50	6.6
CDO	31.06	18.38	Comdisco Inc.	30.75	-0.88	2.8
CPU	37.25	13.25	CompuSA Inc. (H)	35.63	-1.00	-2.7
CHRZ	45.67	16.63	Computer Horizons	32.56	-3.56	-9.9
CSC	86.50	57.88	Computer Sciences	72.94	0.31	0.4
TSK	49.38	16.00	Computer Task Group	35.44	-5.88	-14.2
EGGS	11.13	3.63	Eggshead Discount Software	9.38	-1.44	-13.3
EDS	63.38	31.75	Electronic Data Systems Corp.	35.50	-1.56	-4.2
ICO	40.63	19.75	Inacom Corp.	38.31	-1.00	-2.5
INEL	10.75	2.25	Intelligent Electronics	4.38	0.00	0.0
KEA	39.00	11.50	Keane Inc.	32.81	-1.06	-3.5
MICA	29.75	12.31	Microage Inc.	22.50	-6.75	-23.1
PAYX	42.38	25.63	Paychex	38.00	-0.88	-2.3
PMS	64.94	34.75	Policy Management Sys.	58.88	-2.38	-3.9
REY	30.63	13.75	Reynolds and Reynolds	18.75	-0.88	-4.5
SCBI	22.25	10.75	SCB Computer Tech. Inc.	20.75	-0.38	-1.8
SEIC	44.13	18.75	SEI Corp. (H)	39.63	-0.88	-2.2
SMS	61.75	36.75	Shared Medical Systems	52.56	-1.38	-2.5
SSPE	33.50	10.00	Software Spectrum Inc.	15.25	-2.75	-15.3
SDS	27.13	18.50	Sungard Data Systems	24.38	-0.19	-0.8
VST	29.38	6.50	VanStar Corp.	14.75	-1.94	-11.6

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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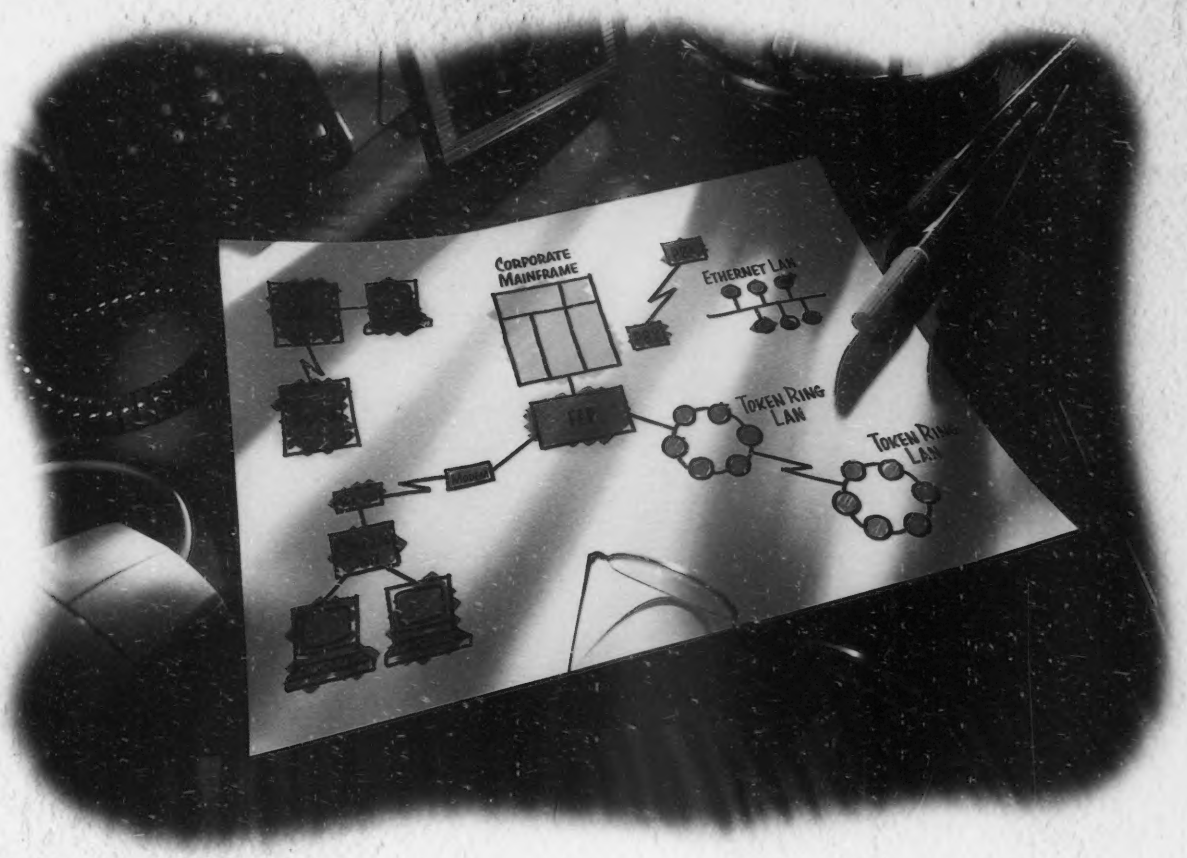

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Sun wants its Java logo back

CONTINUED FROM COVER 1

federal court in San Jose, Calif., to ask for $35 million in damages. The suit originally sought only to retract Microsoft's Java license [CW, Oct. 13].

Officials at Mountain View, Calif.-based Sun said the company is mostly focused on getting the logo injunction at an unscheduled pretrial hearing.

"Our objective is for Microsoft to ship a compatible" Java Development Kit 1.1 in Internet Explorer 4.0, said George Paolini, director of marketing at Sun subsidiary JavaSoft. "We want them to honor their contract and thereby sustain their right to use their license."

Users caught in the middle reiterated last week that they want to wait out the battle without getting caught in the smoke and flames.

Dennis Kremer, a programmer at Pittburgh-based RPS, Inc., said his package-shipping company would continue its Java application work.

The company has a World Wide Web-based package-tracking system that uses Java. "I expect it all to shake out eventually," he said. "Long term, I see Microsoft falling into line, but short term, I see them trying to spread fear and doubts."

Microsoft, which has until Oct. 26 to respond to the lawsuit, continued its barrage of shots at Sun, calling the lawsuit a "bogus, cynical and manipulative attempt to influence public opinion."

Last week, the companies agreed to release the previously confidential licensing agreement, putting it up on their respective Web sites.

They also continued the barrage of disparaging remarks and arguments over several points in the contract.

LARGER ISSUE

While Sun and Microsoft throw verbal punches at each other, some observers suggested that they are missing the point.

"Everybody is diving down into the details of the contract, when the overall picture is what the contract is geared to do," said Tim Sloane, an Internet analyst at Aberdeen Group, Inc. in Boston.

"The whole purpose [of the contract] is not to allow incompatible [Java] versions to get out there. ... From a technological sense, [Internet Explorer 4.0] is not compatible. It doesn't execute all the classes and functions that are part of the Java test suite and part of the ongoing program," Sloane said.

Sun claims Microsoft posted the Java source code on its Web site in a beta version of Internet Explorer 4.0, which would have violated a contract agreement to keep the code confidential.

Paolini said Microsoft took the code down on Oct. 6 in response to Sun's complaints.

Cornelius Willis, director of platform marketing at Microsoft, said that as far as he knows, Microsoft never made the Java source code available. □

THE FACTS

- Sun files a breach-of-contract lawsuit against Microsoft Oct. 6 in federal court in San Jose, Calif.
- Sun files an amended version of the lawsuit, adding a request for $35 million in liquidation damages.
- Microsoft is given until Oct. 26 to file an official response.
- A pretrial hearing is to be scheduled after the court receives Microsoft's response.
- Sun seeks an injunction against Microsoft's use of the Java Compatible logo at the pretrial hearing.
- In the lawsuit, Sun calls for Microsoft's Java license to be rescinded and asks for shipments of Internet Explorer 4.0 to be stopped. Sun calls these requests 'legal options.'

Point/counterpoint

Key arguments in Sun's breach-of-contract lawsuit against Microsoft include the following:

THE ALLEGED RELEASE OF CONFIDENTIAL JAVA SOURCE CODE

- Sun alleges that the source code was posted on Microsoft's Web site in the beta version of Internet Explorer 4.0 and wasn't taken down until Oct. 6 — after Sun complained.
- A Microsoft spokesman said to his knowledge the source code was never posted.

MICROSOFT'S ALLEGED ADDITION OF WINDOWS-FOCUSED TECHNOLOGY TO JAVA IN INTERNET EXPLORER 4.0

- Sun said Microsoft added Windows fields and methods and labeled them as Java classes, confusing developers trying to build platform-independent applications.
- Microsoft said it acted within its rights when it added Windows capabilities and classes without changing any of Sun's classes.

JAVA-COMPATIBLE LOGO

- Sun said Microsoft's version of Java isn't compatible and shouldn't bear the logo. Sun is asking for an injunction on the logo at an upcoming pretrial hearing.
- Microsoft said it has delivered the most compatible implementation of Java in the market.

WILL THIS GO TO COURT?

- A Sun spokesman said the company wouldn't preclude the possibility of a settlement.
- A Microsoft spokesman said the best place to settle this is in court.

— Sharon Gaudin

Auto group forms year 2000 center to aid suppliers

CONTINUED FROM COVER 1

The Automotive Industry Action Group (AIAG), a trade association in Southfield, Mich., last week said it will help the Big Three automakers monitor the year 2000 readiness of industry suppliers.

Earlier this month, the AIAG sent a self-assessment survey to the industry's 50,000 top suppliers to get status reports on their year 2000 efforts.

TRADE-OFF

A chief information officer at an auto distributor said he was relieved that the influential AIAG sent the survey to his company's CEO.

"Now all of a sudden, my boss is recognizing a problem that I tried telling him about months ago," said the CIO, who requested anonymity.

In return for the AIAG's help, the top-tier suppliers are expected to educate their lower-tier suppliers, whose inaction could have the most serious ripple effect on the auto supply chain.

ONE WEAK LINK

Even if a small but significant supplier of a key component such as carburetors stops making or delivering parts because of a year 2000 glitch, the entire supply chain could come to a grinding halt, said Don Blair, associate director of the AIAG.

The survey results, due Oct. 31, will be posted on a World Wide Web site slated to go live in December.

Suppliers will update the status reports via the Web so the Big Three — Ford Motor Co., Chrysler Corp. and General Motors Corp. — can monitor year 2000 readiness throughout their respective supply chains, Blair said.

Participants in the AIAG program also will have online access to a database of year 2000 project tips and resources.

The AIAG initiative is an important wake-up call for the North American auto industry, which has been late in responding to the supply-chain issues, said Joe Bione, lead partner in the AIAG for Deloitte & Touche Consulting Group in Detroit.

> The Automotive Industry Action Group initiative is an important wake-up call for the North American auto industry, which has been late in responding to the supply-chain issues.
>
> — Joe Bione, Deloitte & Touche

The AIAG effort is important "because most of the industry is running older mainframe applications" that have to be fixed, said Thomas J. Morgan, director of information technology at Peregrine, Inc., a Southfield, Mich., maker of auto components such as interior door panels.

Morgan said Peregrine has worked with some of its larger suppliers on year 2000 compliance for electronic data interchange, but he said he is worried about how ma-and-pa shops will deal with the issue.

"It's a big concern. We depend on those shops for materials," Morgan said.

More information about the AIAG Year 2000 Task Force program is available at the AIAG's Web site (*www.aiag.org*). □

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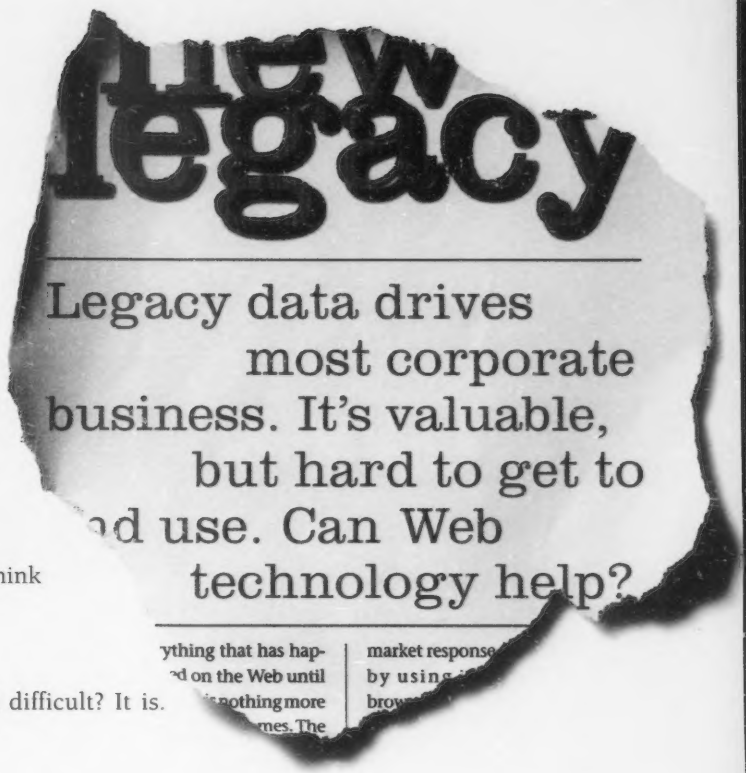

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COMMENTARY

A voice from Auschwitz speaks to IS

Allan E. Alter

Can a survivor of Auschwitz have a message for IS managers? After receiving an unexpected present, I have to say "yes."

As a thank-you gift for speaking before them, the participants in an IS leadership training program gave me a copy of Viktor E. Frankl's memoir, *Man's Search for Meaning*. Frankl was a psychologist who survived three years in the Nazi concentration camps. In 1946, he wrote the book to describe how the survivors, and those who died with dignity intact, managed to endure.

Participants in the Society for Information Management's (SIM) Regional Learning Forum must read about 70 books on leadership, business and personal development. Yet Bart Bolton, the course leader, says this book was the group's hands-down choice to send as a gift. Why, I wondered, did they choose this one? What did Frankl say that meant so much to them?

So I sought out Bolton's students and other forum graduates at the SIM conference, held last month in Boston.

They said Frankl showed them that your core values, the meaning you find in life and your hope for the future help you survive. Frankl's love for his wife, whom he thought was alive (sadly, she was not), gave survival a purpose. That resonated. "You have to hold onto something to keep going," I heard these managers say. "Through the mud and the crud around you, stay focused on your essential purpose — why you are there, who you are," said John McWilliams, an IS manager at Lotus.

Some were especially struck by Frankl's description of how starvation, pain and abuse led some inmates to give up all hope; they lay down in the filth to die. "While our situation is not as grim as theirs, there are times in IS when it's hard to keep going," said a Learning Forum participant. IS professionals endure disappointment, disrespect and projects that some have likened to death marches.

"Your surroundings can demotivate you until you lose all creativity," said Jerry Smyers, a vice president at First Chicago NBD.

"You can see the people who give up," another said. Perhaps Frankl's greatest lesson is that even in extreme situations, no one can take your dignity away. Joel Avila, a director at Titleist and FootJoy Worldwide, drew this moral from the book: "The last of human freedoms is to choose one's attitudes, and this cannot be taken away from you." And three IS managers told me, as if they were one person, "You can create your own attitude: they can do anything to you, but how you respond is up to you." If people could do this in a concentration camp, certainly they can do it on the job.

A few days later, I read *Man's Search for Meaning*. I kept thinking about the book and what those IS managers said. In particular, I couldn't get out of my mind a serene young woman whose death Frankl had witnessed. She had pointed out to him a blossoming chestnut tree seen through a window.

"This tree here is the only friend I have in my loneliness," she said. "I often talk to this tree." Wondering if she was delirious, Frankl asked if the tree replied. "Yes. It said to me, 'I am here — I am here — I am life, eternal life.' "

This story contains many meanings, but one that might apply to IS is this: We all need to find meaning in our lives, and one of the ways is through our work. IT leaders can't provide that meaning. As Frankl says, everyone has to find it for themselves. But leaders might be able to do for their staffs what *Man's Search for Meaning* did for the managers who took this course: help others find something to hold onto when life in IS is at its worst. □

Alter is Computerworld*'s senior editor, Managing, and editor of the Leadership Series. His Internet address is allan_alter@cw.com.*

Why Intel gets off easy

David Moschella

A few weeks ago, a friend of mine asked: "How come you frequently write about the surging power of Microsoft, but hardly say a word about Intel? After all, Intel is actually the bigger and more profitable company, and its market share is pretty much the same."

That question reoccurred to me as recent headlines reported that Digital might sell its Alpha business to Intel, that Advanced Micro Devices (AMD) is once again falling short of its microprocessor goals and that the Federal Trade Commission is investigating Intel's overall business practices.

No matter; I still can't get too worked up about Intel's power because although the Microsoft and Intel stories appear so similar, underneath they are as different as hardware and software.

Hardware markets eventually become competitive. Regardless of industry, try to find a vendor that has ever succeeded in maintaining a total hardware monopoly. An IBM, a Boeing or an Intel might sustain a very high market share, but eventually sufficient competition emerges to keep such companies' power at least partially in check. In contrast, 33 years after IBM's S/360 software emerged, no serious compatible mainframe software alternative has emerged.

I must admit that serious competition to Intel has taken longer than I would have expected. There have always been three potential challenges: Intel-compatible chips, alternative (mostly RISC) architectures and a major market shift toward non-PC devices. The latter two have always been the long shots. The so-called PCM (which sometimes stands for Plug and sometimes Program Compatible Manufacturer) approach has always been the most direct and proven path.

Although the PCM business continues to stumble along in fits and starts, it will eventually take off. It's almost unimaginable that as the Asian PC market becomes the world's largest, giants such as NEC, Toshiba, Samsung and emerging Chinese players will be content to write ever-bigger checks to Intel.

At some point, the advantages of throwing their support behind a compatible alternative will become overwhelming. No amount of Intel Inside or other advertising incentives will stop it. The only questions are how soon this will occur and whether it will center around AMD, Cyrix or some new effort altogether.

The shift toward a network-centric IT industry will provide strong support to any such initiative. Increasingly, incremental desktop MIPS will matter less and less, and therefore it will get harder and harder for Intel to stay meaningfully ahead of the competition. Fifteen years from now, microprocessors will be almost as much of a commodity as dynamic RAM is now. Intel will still grow and prosper, but its near-monopoly position will eventually erode.

Microsoft is on track to sell its operating systems to hundreds of millions, perhaps even billions, of users. Unlike the Intel case, the odds that a compatible operating system will emerge remain virtually nil. Of course, the simplest reason to write about Microsoft and not Intel is that IS organizations actually choose to buy products from Microsoft, but they buy from Intel only indirectly.

All IT industry history suggests that if vendors succeed in building a stable set of compatible hardware products, users will be perfectly willing to buy them. But no matter what vendors do, customers just aren't interested in buying compatible operating system software. Again, it's the difference between hardware and software; it's really as simple as that. □

Moschella (david_moschella@cw.com) is an author, independent consultant and weekly columnist for Computerworld.

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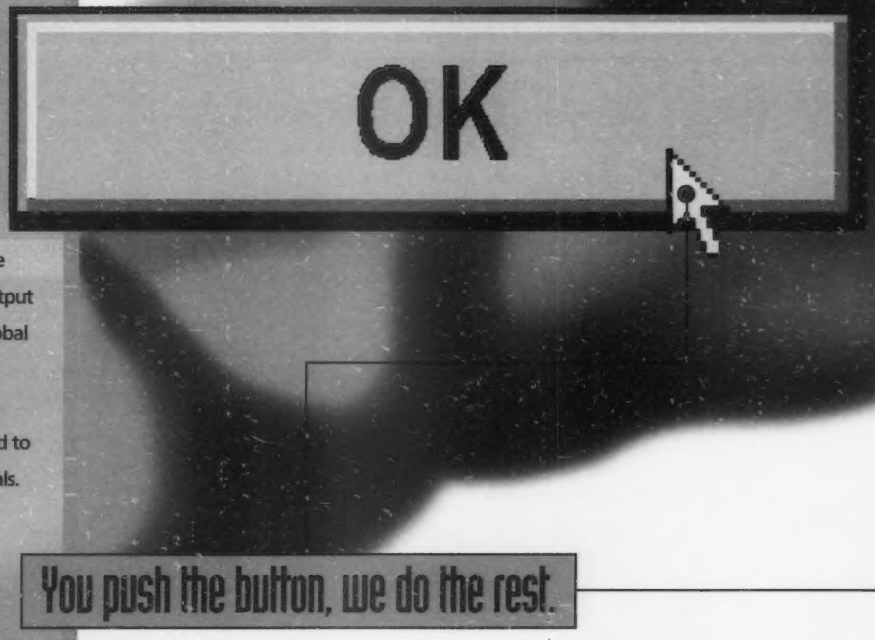

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The Back Page

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Dispatches & images from the fringes of the electronic frontier

ROBOT ANIMALS INVADE CALIFORNIA

"The Robot Zoo," an interactive exhibit sponsored by Silicon Graphics and *Time* magazine, recently opened at The Tech Museum of Innovation in San Jose, Calif. It features eight giant robot animals and computer workstations that show children how a chameleon changes color and a giraffe flexes his long neck. Even grown-ups may want to try the Tongue Gun, which fires a long tongue at insect targets to show how a reptile catches food.

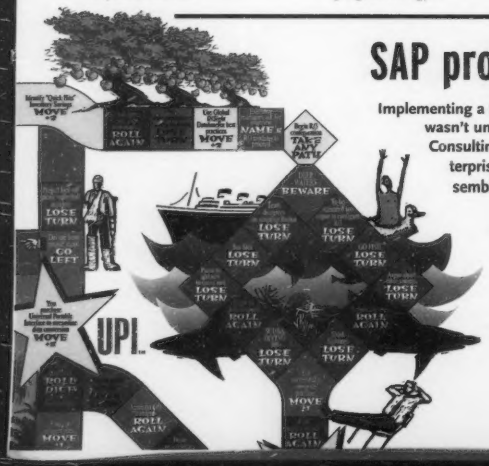
Usenet forums

The following are recent Usenet newsgroup discussion threads that were found on the Internet. You might be able to pick up the thread by entering keywords at the search engine www.deja-news.com.

- Privacy of patient files in hospital databases *(sci.med.informatics)*
- Interoperability of operating systems and network operating systems *(comp.dcom.lans.misc)*
- Client/server obsolete? *(comp.client-server)*
- Intranet content management *(comp.groupware)*
- The Intel Alpha chip? *(comp.sys.dec)*
- Programmer analysts needed in Bermuda *(comp.programming)*

Digital frontiers

Leave the No. 2 pencils at home. The standardized test for graduate business schools is going digital, the Associated Press reports. Beginning this month, would-be MBAs will fill out multiple-choice circles on a computer screen instead of on paper.



SAP project fails, lose job

Implementing a SAP R/3 system isn't a game. Well, at least it wasn't until the marketing minds at Deloitte & Touche Consulting Group came up with Value Quest: The Enterprise Transformation Game. The board game resembles Milton-Bradley's Life game except players don't adopt triplets or end up in the poorhouse. Instead, they lose turns because of a "project kick-off picnic volleyball accident" or because "business end users don't understand why change is needed." The game is won by the player who "realizes measurable return on investment and maximum value." Better pop some more popcorn; this could be a long game.

— Randy Weston

Inside Lines

How about General McAfee?

McAfee Associates and Network General Corp. last week announced plans to merge, forming a new company called Network Associates, Inc. But apparently nobody researched that name thoroughly. There's already one player in the networking industry with that identity — Provo, Utah-based Network Associates, a high-tech public relations agency that happens to represent McAfee's rival in virus protection tools, Symantec.

There's life after Cairo

Windows NT 5.0 is still at least a year away from shipping, but leave it to Microsoft to have already picked out a code name for Windows 6.0. Sources close to the company said the software has been dubbed Millennium because it's expected to ship in 2000. There are at least two versions of Millenium on the drawing boards at Microsoft — one will be a "Personal Version" that replaces Windows 98 and will be pre-installed on PCs. The Server and Enterprise flavors of Millennium were designed to coincide with Intel's forthcoming 64-bit Merced chips.

Bay broadens IP support

Bay Networks, Inc., this week will broaden the reach of its IP support by announcing its strategy for virtual private networks, IP address management and support for IP Version 6.0. The vendor also will outline security for IP networks and address terminal emulation to SNA gateways. Bay officials couldn't be reached for comment.

The price isn't right

If you're a good capitalist, you probably assume that once book seller Barnes & Noble jumped online in response to the *www.amazon.com* Web site, the competition would have resulted in lower prices. In fact, Joseph Bailey, a doctoral candidate at the MIT in Cambridge, Mass., found that Amazon's prices actually rose to meet Barnes & Noble's prices. Bailey said he isn't sure why that happened, but he speculated it might be because the competition allows the setting of market prices as opposed to initial lowball guesses.

Software AG victim of COM-job

That kicking and sobbing you hear may be coming from Bellevue, Wash., where Software AG may have just had the rug pulled out from under its feet. Software AG is in the process of porting Microsoft's Distributed Component Object Model architecture to non-Windows platforms. Microsoft is moving away from DCOM to its new and improved COM+ architecture for its Windows NT platform. Software AG hasn't been invited onto the COM+ bandwagon.

Super FLOPS

MIT this week will unveil its most powerful supercomputer to date: Pleiades, a 26GFLOPS machine. Pleiades is a Digital Equipment Corp. multiprocessing machine that will be used by MIT researchers to model climate changes, virtual reality cityscapes and drug development. Not to be outdone, IBM next year plans to deliver to the U.S. Department of Energy a 4,099-processor RS/6000 SP supercomputer that it claims can handle 3 trillion teraFLOPS.

Asked for her first reaction to GTE Corp.'s $28 billion bid for MCI Communications Corp., Rebecca Wetzel, an analyst at TeleChoice, paused, then sighed: "Wow, that's a lot of cash." If you have a pithy, yet understated reaction to an industry news event, contact news editor Patricia Keefe at (508) 820-8183; or E-mail her at patricia_keefe@cw.com.

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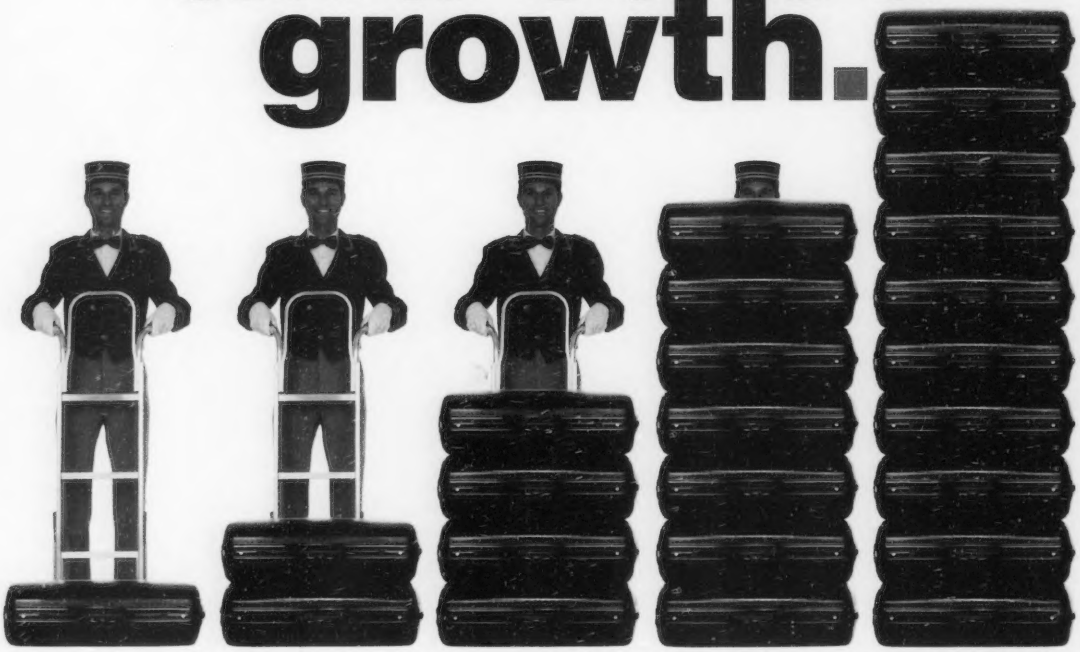

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